The Health Question Box

or

A Thousand and One Health Questions Answered

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BATTLE CREEK, MICH.
MODERN MEDICINE PUBLISHING CO.
1920

Foreword

For more than forty years, the writer of this volume has each week stood before an audience of invalids at the Battle Creek Sanitarium to open a popular question box. During a longer period the writer has supplied each month to the monthly journal, Good Health, several columns of answers to correspondents. Out of the seventy or eighty thousand questions which have been thus dealt with something more than a thousand have been selected, which with their answers, constitute this volume. The reader will naturally expect to find the subject matter of this book highly practical in character, and in this we are confident he will not be disappointed. It is also believed that the range of topics considered is sufficiently large to cover in a fairly comprehensive way the whole subject of practical hygiene, as related to the home and individual.

Any reader who, in consulting this volume, is disappointed in not finding an answer to the question in which he is especially interested, is hereby cordially invited to ask the question in a letter addressed to the author or the publishers who will at once endeavor to find the answer and communicate it to the questioner, and will incorporate the question, if of general interest, in the next edition of the work, or another volume of similar character. J. H. K.

October, 1917.

PREFACE TO SECOND EDITION,

The first edition of this work was quickly exhausted and it has been for some months out of print, waiting for the needed revision to enable it to represent the latest advance in the rapidly progressive science of biologic living. Several hundred questions have been added—together with many illustrations and other changes have been made which it is believed will give the work greatly increased interest and value, both to the general reader and the student of personal hygiene.

J. H. K.

March, 1920.

Illustrations

The Health Question Box

OR

A Thousand and One Health Questions Answered

Artificial Feeding of Infants

Q. **What is the best plan for artificial feeding of infants?**

A. Recent experience in both this country and Europe justifies the claim that the following simple plan of artificial feeding may be relied upon as best for the infant as well as the simplest, least expensive, and least troublesome to the mother, and hence most practical for general use:

During the first year: Number of feedings in twenty-four hours, first month, 8; second month 6; after second month, 5.

Milk Mixtures: First month, one-third milk, two-thirds water, with two ounces malt sugar to the quart. One ounce gives 14 calories.

Second to sixth months, half water, half milk, with two ounces of malt sugar to the quart. One ounce gives 17 calories.

Third quarter—7th to 9th months—use two-thirds milk, one-third water, two ounces of malt sugar to the quart. One ounce gives 21 calories.

Fourth quarter—10th to 12th months—use

full milk with addition of two ounces of malt sugar to the quart. One ounce gives 25 calories.

Age	Weight	Amt. of Food	No. of Feedings	Amt. of Feeding	Calories Daily
Birth	7 lbs.	20 oz.	8	2½ oz.	350
1 mo.	9 lbs.	24 oz.	6	4 oz.	400
2 mo.	10½ lbs.	28 oz.	5	5½ oz.	475
3 mo.	12 lbs.	30 oz.	5	6 oz.	510
4 mo.	13 lbs.	32 oz.	5	6½ oz.	545
5 mo.	14 lbs.	34 oz.	5	7 oz.	575
6 mo.	15 lbs.	36 oz.	5	7¼ oz.	612
7 mo.	16 lbs.	32 oz.	5	6½ oz.	640
8 mo.	17 lbs.	33 oz.	5	7½ oz.	660
9 mo.	18 lbs.	34 oz.	5	8 oz.	680
10 mo.	19 lbs.	28 oz.	5	5⅔ oz.	700
11 mo.	20 lbs.	29 oz.	5	5¾ oz.	725
12 mo.	21 lbs.	30 oz.	5	6 oz.	750

Infants under one year should not take more than 32 to 36 ounces of food. In changing to stronger diet, that is from half milk to two-thirds milk, or two-thirds milk to full milk, the quantity should be reduced at first. After the child weighs eighteen pounds, the amount may be increased one ounce of the full milk mixture for every six ounces that he gains in weight.

Bottle Fed Babies

Q. **Why are so many infants bottle fed?**

A. The manufacture and sale of "baby foods" has developed into an enormous industry within the last 50 years. The maternal fount is drying up.

According to Holt, "In New York, at least three children out of every four born into the homes of well-to-do classes must be fed at some

other fount than the maternal breast." A professor of entomology, of the University of California, finds an analogy between the human race and bees, ants and some other insects. He insists that the increasing number of women who have lost both the instinct and the capacity for motherhood is evidence that there is developing in the human race a neuter type corresponding to the worker class among bees and ants. In certain parts of the United States the decay of the native population as shown by diminished fertility is far advanced. For example, among native-born New England wives the average number of children is only 2.7, while foreign-born wives have an average of 4.4 children.

Orange Juice and Fruit Purées for Infants

Q. **Is orange juice essential in the feeding of children and is there any safe substitute?**

A. The juice of sweet oranges is an important, almost essential, aid in the artificial feeding of infants. Orange juice is rich in vitamines. When sterilized milk is used, orange juice is necessary to supply the vitamines which boiling destroys in the milk and which are absolutely essential for the healthy development of the infant. The observations of Holt and others show that every bottle-fed child requires at least one ounce of orange juice when cow's milk is used. The orange juice should be given in doses of one to three teaspoonfuls at intervals during the day.

When sugar and cereals are used, the amount of orange juice must be increased in propor-

tion to the amount of sugar or cereals added to the milk, The more sugar or starch, the more orange juice is needed.

In children who show evidences of scurvy, four or five ounces of orange juice must be given daily to supply the needed vitamines. It is now known that in cases in which it was formerly supposed that infants were suffering from an excess of cereals in the food, the real fault was the absence of vitamines in the food. Fine wheat flour and prepared infant foods are lacking in vitamines. This discovery has already been the means of saving thousands of infant lives. Every mother should know that orange juice is highly valuable in infant feeding.

Purées of ripe fruit such as sweet apples, pears, and bananas, prepared by pressing the fresh pulp through a fine colander, are exceedingly wholesome and useful additions to the dietary of the bottle-fed infant. Modern physiological experiments have shown the necessity for variety in foodstuffs, especially to install a full supply of all the different vitamines, salts, and other elements, the essential value of which has only recently come to be appreciated.

Tomato juice and the juice of raw swede turnips are also efficient as means of preventing scurvy in infants. To a very young infant give a teaspoonful of juice (orange, tomato or turnip) daily. Every two months increase the quantity by a teaspoonful daily.

Comby's Method of Infant Feeding

Q. **What is Comby's method of infant feeding?**

A. By this method the infant is allowed daily 2½ ounces of food for each pound of its weight. The dilution of the cow's milk is determined by the child's age, making the age in months the numerator of a fraction and the next month the denominator. Thus a child at one month would receive ½ milk, at two months ⅔, and at three months ¾ milk. In some cases greater dilution is necessary. There is much more danger from too concentrated a milk solution than from a too dilute solution, and the younger the infant the greater the danger.

Regurgitation of the Food in Infants

Q. **What is the cause of regurgitation of the food in young infants?**

A. Regurgitation often occurs when the infant is fed more than his stomach can hold. His food should be diminished in quantity. If he is breast fed, shorten his time of feeding by a few minutes. If he is bottle fed, give him an ounce or two less food. At birth the stomach of the average baby is only capable of holding six or eight teaspoonfuls. It gains in capacity for food, holding about half an ounce per meal for each month of life. A child will not be able to retain a half-pint nursing bottle full of food before it is at least eight or ten months old.

Children should be trained to eat slowly, no

matter how hungry, or what important matter is pressing. Much better, a little food well masticated than a hearty meal swallowed in haste.

Infants' Stools

Q. **What should be the appearance of the stools of a young infant?**

A. The color of normal stools from children fed on cow's milk is yellow, but not so bright a yellow as the stools of the breast-fed child; on standing exposed to the air, they turn nearly white or greyish-yellow. If carbohydrates, gruels, replace cow's milk as food, the yellow colour of the stools is more intense.

Lime Water in Milk

Q. **Is the addition of lime water to milk beneficial in feeding infants?**

A. The idea seems to be current that lime water used in cow's milk is a valuable addition to the baby's diet, and will prevent rickets. The impression holds that the baby is going to get needed lime out of the lime water.

People who entertain this notion are entirely oblivious of the fact that milk itself contains more lime than does lime water. This lime is held in solution by the casein of the milk. Another important difference is this, that the lime of the milk is organic lime, organized lime, lime that is ready to be assimilated, whereas the lime in the lime water is dead lime, mineral lime. There is abundant evidence that this mineral matter can not be assimilated by the body, and very little of it can be used.

Nor is this all. The lime water may do harm. Lime is an alkali; it neutralizes the hydrochloric acid of the gastric juice, and so injures digestion. There is already too much lime in cow's milk for the baby's needs. The milk of various species of animals is adapted to those animals, and the amount of lime in the milk depends on the rate at which the young animal grows. A calf will double its weight in six or eight weeks, but a baby requires five or six times as long to double its weight, so the calf requires four or five times as much lime.

Other animals—dogs and rabbits, for example—that double their weight very rapidly have as high as one hundred times as much lime as there is found in the normal food of the baby. Babies grow very slowly, and consequently they need but little lime. Mother's milk contains only three grains of lime to the pint, instead of twenty-six, as in cow's milk.

Milk in its ordinary state needs dilution for the baby. The only real value of lime water is to dilute the milk and this is far better done by the use of pure boiled water, or by the use of very thin, well boiled and strained barley or oatmeal gruel.

Fruit for Children

Q. **May fruit be given to little children?**

A. The juice of any ripe fruit may be given to children after six months. The idea that fruit is dangerous for young children is a most mischievous error. Great care must be taken that the fruit is thoroughly ripe. In case of very

young children who have no teeth, and who have not yet learned to masticate their food thoroughly, only the juice should be given. Older children who have teeth may take fruit as freely as adults without injury. Fruits have a beneficial laxative tendency.

Orange juice in teaspoonful doses may be given to an infant at any age. It is highly necessary when pasteurized or sterilized cow's milk is given. Tomato juice and other fruit juices may be used in the absence of oranges.

Diet for Teething Child

Q. **What is a good diet for a teething child?**

A. If teething begins while the baby is still feeding from the breast, no other food than mother's milk is required. At ten months the normal child has six teeth.

It is highly important that the food should at all times contain an abundance of lime.

After weaning, food which is rich in lime should be taken at every meal. Greens and root vegetables finely mashed or in the form of purée should be freely used. Graham flour bread should be used instead of white. Malt sugar should be used instead of cane. Care should be taken that the bowels move four times a day. Give an enema of 3 to 4 ounces of water at 90° F. if necessary.

Q. **Since teething is a natural process why do derangements of digestion so commonly accompany it?**

A. It is most unfortunate that mothers are not better informed. Very many have heard that

diarrhea, mucous discharges and other bowel troubles are inevitable results of dentition and supposing they will cease when the teeth are through give the matter little concern, unless it assumes so grave a form as to be alarming. Even then the fact that the child is teething serves as an apology for its serious condition.

Every one who has the care of an infant should understand that teething is a normal process and not a disease, that it is not needful for the bowels to be out of order and loose when the child is teething, and that bowel disorders of infancy are usually the result of taking spoiled or unclean food, too much food, meat, or food in lumps that the child cannot masticate.

Teething is not of itself a potent cause of disease; while it may intensify the effects of bad food, bad water, foul air, extremes of heat and cold, and the like, vet these causes are responsible for the mortality of infants at the teething period as well as at every other age. This is an important fact to remember, as these conditions are all more or less preventable.

Weaning

Q. **At what age should an infant be weaned?**

A. Nine to ten months.

When to Vary an Infant's Food

Q. **When may food properly be given in connection with the mother's milk?**

A. A moderate amount of prune juice or orange juice diluted with boiled water may be

given to a six months' old baby. To a baby who is well nourished and thriving on mother's milk, absolutely no other food should be given but strained fresh fruit juices until after the child is weaned.

How Much Should a Child Eat?

Q. **How many calories should a child weighing eighteen pounds take daily?**

A. A child must have not less than fifty calories per kilogram of the body weight. We may say twenty-five calories to the pound of body weight. This is the minimum for growth. The child really needs more than that. A child weighing eighteen pounds ought to eat about six to eight hundred calories a day.

First Cereal Food for Babies

Q. **What is the best cereal food for a baby beginning its second year, and that is being weaned from a malt sugar and milk formula?**

A. Rice gruel, potato gruel, and wheat meal gruel are the best farinaceous foods for an infant. The diet should never be confined to cereals, as this class of foodstuffs is deficient in alkaline salts, which are quite essential for growing infants.

Pasteurized Milk and Scurvy

Q. **Does pasteurizing or boiled milk produce scurvy?**

A. For some years there has been a warm discussion among physicians respecting the danger of scurvy from the use of sterilized or pasteurized milk. Many have claimed that pasteur-

izing does not devolve the risk of scurvy, while a few have maintained that even sterilizing the milk by boiling was perfectly safe. Recently, however, several outbreaks of scurvy among infants have been reported which were traced to the use of cows' milk which had been pasteurized at less than 146 degrees Fahrenheit. Recent laboratory research has shown conclusively that the nutritive principle in foodstuffs which prevents scurvy is destroyed by heating. It is now evident that the only safe plan to be followed in the artificial feeding of infants is to make use of certified milk, that is, cows' milk which has been produced under conditions which insure freedom from harmful contamination. The cows must be tested for tuberculosis by skilled experts, and the methods of obtaining and preserving the milk must be such as will insure the utmost cleanliness and protection from contamination with bacteria from the body of the cow or from atmospheric dust.

When certified or clean milk is temporarily unobtainable, pasteurized or sterilized milk may be used for a time with comparative safety provided lemon juice, orange juice, tomato juice, or the juice of the sweet turnip is used.

Diet for Child of Two Years

Q. **What is the best diet for a two year old child?**

A. Fresh fruits, stewed fruits, purees of vegetables and cereal foods are suited to the child's wants and with milk and cream are capable of supplying all its nutritive needs. The

best cereal preparations are wheat flakes, shredded wheat biscuit, oatmeal, cracked wheat, rice, graham bread. Potato and other vegetable purees, and purees of fresh or stewed fruit should also constitute a considerable part of the dietary. Malt sugar should be used freely with cereals and fruits, but cane sugar should be avoided. It is an unwholesome sweet, even for adults in other than very small quantities, and often produces decidedly injurious and even poisonous effects in young children.

Children should be taught to drink frequently. Three to four ounces of water should be given several times a day between meals.

Most of the various popular infant foods are objectionable, as their exclusive use leads to rickets and malnutrition.

Pastry, candies, ice cream and soda water drinks, should be avoided by young children.

Tea, coffee, chocolate, and coca cola contain caffeine which is productive of great harm. A cup of coffee contains twice as much uric acid or its equivalent, as does the same amount of urine. These harmful drinks should never be given to children at any age.

Children should be taught from the first to masticate their food thoroughly. This is highly important, as the habit of mastication formed in childhood is likely to be maintained throughout life.

Regularity of meals is also highly important. Upon regularity of meals depends regularity of bowel action. Food is the natural laxative. When food is taken between meals or at irregular in-

tervals, digestion becomes disturbed, normal bowel action is interrupted, and numerous evils result. It is especially important to avoid taking food at too frequent intervals. When food is received into a stomach which contains undigested food, serious indigestion is certain to result.

Vomiting in Infants

Q. **How may one prevent a three months' old baby from vomiting its food very soon after eating?**

A. Those who handle the little one are often to blame for its misfortune. Tossing the baby up and down, jogging it upon the knee or placing it over the shoulder and patting it upon the back just after its meal are abuses which conduce to make it throw up its food.

If a baby has a tendency to vomiting soon after eating, it should be allowed to remain quietly in a recumbent position for a time.

More than likely the cause is a too large intake of food, or too rapid feeding.

Non-Flesh Diet Best for Children

Q. **Should children be allowed to eat meat?**

A. Professor Sherman of Columbia University, an able physiologist, several years ago called the attention of the profession to the fact that meat is lacking in lime salts, and consequently is not a suitable food for children. Professor Sherman's statements are based upon the results observed in experiments upon animals. His observations fully confirm the views of Dr. Joseph

Winters, an eminent physician, who a few years ago presented to the profession an able and interesting essay entitled "The Meat Habit in Children." Dr. Winters maintained that one of the most evil consequences of the early use of meat by children "is the loss of relish it creates for the physiological foods of childhood—milk, cereals and vegetables." Said Dr. Winters:

"A child that is allowed a generous meat diet is certain to refuse cereals and vegetables. Meat, by its stimulating effect, produces a habit as surely as does alcohol, tea, or coffee, and a distaste for less satisfying foods. The foods which the meat-eating child eschews contain in large proportions certain mineral constituents which are essential to bodily nutrition and health, and without which the processes of fresh growth and development are stunted."

Dr. Winters attributes to the use of meat many of the disorders to which children are subject, particularly incontinence of the urine, rheumatism, chorea, rheumatic inflammation of the tonsils, night terrors, urticaria, anemia, convulsions, and even epilepsy.

Dr. Winters insists that "there is more so-called nervousness, anemia, rheumatism, valvular disease of the heart, and chorea at the present time in children from an excess of meat and its preparations in the diet than from all other causes combined."

Board of Health Condemns Meat for Children

Q. **Some popular writers highly recommend meat as a diet for young children. Is there a scientific basis for such a recommendation?**

A. By no means. There are many reasons why meat should be condemned as an article of food for children, even more plausible than for adults. The Maine State Board of Health, in one of its monthly bulletins, speaks thus upon the subject:

"Meat becomes a part of the diet of many children much earlier than it should. Of all protein foods (tissue building foods) meat is the most liable to putrefaction in the intestines, and meat protein is no better for growth than milk protein, and is much poorer than milk in valuable mineral salts which are needed for the building of bones which may safely support the weight of the growing body. Another reason why meat should be excluded from the diet of the child until much later than the close of the second year, is that on account of its higher flavor, there is danger that the child may refuse to take milk, which would be unfortunate. Even at the present unreasonably high price for milk, the money spent for it will bring more tissue building material for the growing child than it would if spent for meat."

Diet for Nursing Mother

Q **What is the proper diet for a nursing mother?**

A. Nursing mothers should make free use of fruits and fresh vegetables, avoiding strongly

flavored vegetables, such as onions and garlic. Tea, coffee, wine, beer, condiments, cocoa, pickles, rich gravies, sweet-breads, fish, and oysters should be altogether avoided by the mother. It is best also to avoid flesh meat. All kinds of meat foods are contaminated with bacteria and promote intestinal autointoxication, through which the infant as well as the mother may be poisoned.

The diet should be bulky; that is, it should contain a large amount of indigestible residue. The best foods for bulk are lettuce, carrots, beets, greens, spinach, huckleberries, raspberries, prunes, figs, apples, apricots, graham bread, shredded wheat biscuit, wheat flakes, cracked wheat, rye bread, ripe olives, and bran. Oranges are excellent, and also fruit juices of all sorts, because of the fruit sugar and acids which they contain.

Care should be taken to keep the bowels freely open. They should move three or four times a day, or at least after every meal. If necessary, the enema should be used, employing one to three pints of water at a temperature of 80° F.

The amount of fat should be increased about twenty-five percent above that ordinarily required. The amount of protein should be fifty per cent greater. A tablespoonful of bran should be taken at every meal.

Certain foods tend to increase the flow of milk. This is particularly true of malt sugar, of the whole-grain cereals, cracked wheat, oatmeal, free water-drinking, and the free use of juicy fruits. Not less than three or four pints of water should be taken daily, in addition to the liquids taken with the meals.

Bathing Arm

Bathing Chest

Bathing Leg

GIVING THE BABY A WET-HAND RUB

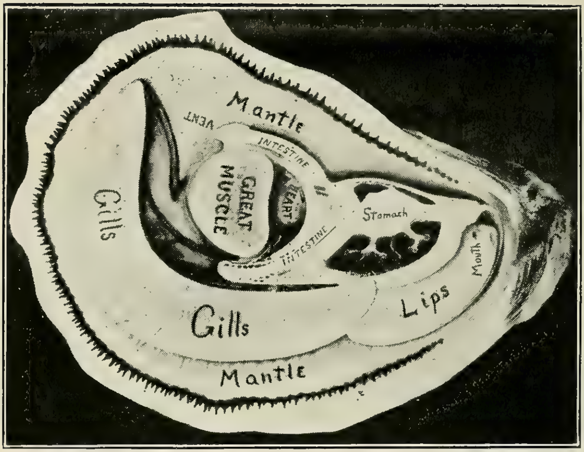


Photo from Dr. Hugh M. Smith.

ANATOMY OF THE OYSTER

"It is an astonishing biological fact that in some species of oyster each sex is represented by a different individual as in the oyster of the Atlantic Coast of North America; while in other species both sexes are united in one individual—the male stage alternating with the female, as in the common oyster of the Atlantic Coast of Europe."

(See page 144)

Almonds, peanuts and nut preparations, particularly Malted Nuts and Protose, are useful in promoting the flow of milk. Experiments made by Dr. Hoobler of Detroit showed nuts and nut preparations to be superior to all other foods for this purpose. He found Malted Nuts particularly useful.

Cold Baths

Q. **To how young a child may cold baths be given?**

A. Babies should not be given very cold baths. Water at 90° F. is cold enough for a young baby. The temperature of an infant's bath should at first be about 100° F., since to its sensitive, velvety skin even this temperature will seem cool; it should however be lowered five or ten degrees at its conclusion; and the general temperature should be gradually lowered from week to week until, when the child is six months old, water of 90° to 95° F. in winter and 85° F. in summer may be employed. With most children under four years it is well to begin the bath at about the temperature of the body if a tub bath is used, and at its close cool the water until the temperature is 80° or 85° F., or end the bath with a very short but not forcible spray of cool water.

Children under seven do not well bear the application of very cold water. A temperature ranging between 70° and 80° F. will produce sufficiently strong impressions to develop a good reaction in children under seven years. An older child may enjoy a bath at lower temperature.

The Pacifier

Q. **Can there be any harm in the use of the "soother" if it is cleansed each time before being introduced into the baby's mouth?**

A. The "soother," "consolation nipple," or "pacifier," as it is variously termed, has long been conceded to be one of the most common means whereby harmful germs are introduced into the mouth of a child allowed to use it.

The effects of the unnatural and prolonged sucking are different with different children, depending upon the way in which the child draws on the nipple.

The worst effect that is laid at the door of the "consolation nipple" is the scourge of adenoids that now assails almost all children in civilized countries.

A series of experiments undertaken to seek out the causes of the prevalence of this disease resulted in the demonstration that the rubber nipple used as a pacifier is one of the most active causes of disease that modern children encounter.

Outdoor Sleeping

Q. **How early in life may a winter baby sleep out of doors?**

A. The writer has known several instances in which babies two or three months old were placed to sleep several hours daily in the open air even in quite cold weather, not only without injury, but with much apparent benefit.

Caution must, of course, be taken to wrap the little one so warmly with a light woolen blanket

that he cannot possibly become chilled. In very cold weather the face may need a light covering with the exception of the nostrils, to which the fresh air should always have free access. The sleeping arrangements should be such as to fully protect from winds and stormy weather. A rather deep laundry basket well lined with warm blankets and placed in a sheltered position on a covered veranda serves well for an infants' bed for outdoor day time naps. The same serves well also for night sleeping. There should always be a conveniently accessible warm room to which the mother can remove the child for any attention needed during the night.

Thumb Sucking

Q. **Is thumb sucking harmful to a baby? If so, how can it be prevented?**

A. This practice tends to produce certain deformities of the teeth and jaws and perhaps still more serious injury. Various measures of prevention have been adopted. The hands may be encased in mitts.

Various other plans have been tried, such as washing fingers with a strong solution of quassia chips, which has an intensely bitter flavor. The surgical instrument dealers have an aluminum covering, very light in weight, that goes over the hands and fastens about the wrist. The movements of the hands are not at all restricted. After wearing this shield for a few weeks, the thumb-sucking habit will be entirely broken.

Still another method is to place a rather stiff bandage about the middle of the arm so as to make it impossible for the child to bend the elbow sufficiently to reach the mouth. These restricting means ought not to be continued so long as to interfere with the proper development of the hands and arms.

The Baby in Hot Weather

Q. **What is the best method of protecting a baby from the injurious effects of hot weather?**

A. Give him cool sponge baths or neutral baths. The child a year or more of age may be allowed short periods of play in bath tub in water at a temperature of 94° F. Play things that float, basins with which he can dip water, etc., will make the time pass rapidly.

Vary the amount and kind of his clothing to suit the temperature. Two or three times a day remove all the clothing and allow the child's body to be fully exposed to the light and air at a room temperature of 75° to 80°F. for half an hour. Be careful to avoid chilling. Sunbaths are very beneficial. They should be of short duration; at first, five to ten minutes; later, half an hour or longer.

Give him plenty of fresh air night and day. However, don't compel him to lie all the time tightly bundled up in his cab among fluffy feather pillows. Provide him a comfortable mattress in some cool place where he can lie straight and stretch and kick at will.

Protect him at all times from flies, mosquitoes

and other tormenting insects, and from floor dust and dirt.

Give him often a drink of cool water, from a source known to be pure or of water which has been freshly boiled, cooled and kept in a bottle.

Have stated times for feeding and feed regularly, not whenever the baby cries. Avoid overfeeding, especially in hot weather.

If not breast-fed, feed by schedule or quantity according to age, as directed by some competent authority. (See page 14).

Use only certified or pasteurized milk and exercise the greatest care as to cleanliness in every particular, and especially screen the food from dust and flies. Give orange juice daily.

Discard pacifiers; they are always a source of injury to the little one.

Don't use soothing syrups, or any patent nostrums.

If the baby is ailing, call a trained nurse or physician to direct its care.

Effect on Children of Parents' Ill Health

_Q._ Does the ill health of parents immediately affect their children?

A. Modern biologic investigations have shown that heredity is not responsible for much that is charged to its account. Pinard, the eminent French gynecologist, investigated twenty-three cases of families in each of which there was a single idiot, imbecile, or degenerate child, with other healthy children. In twenty-two cases he was able to find a cause for the defective child in the illness shortly before conception of one or

both parents from rheumatism, influenza, jaundice, gout, or typhoid fever.

These facts emphasize anew the importance of applying to the human race, so far as possible, those great biologic facts and principles which have been found of such great value in the improvement of breeds of horses, cows, and other domestic animals. The neglect of these laws is developing an increasing population of defectives. Lunatic and feeble-minded asylums are multiplying faster than the increase of population warrants. The race is deteriorating for lack of attention to the plainest teachings of science. The gospel of right living must be taught for the benefit of the unborn as well as of the living.

Birth Mark

Q. What can be done for the so-called mother's mark?

A. These are of various kinds: 1. Raised brown spots, known as moles; 2. Brown spots producing hair; 3. A tumor composed of enlarged blood-vessels, constituting the true "port wine" or "mother's mark." These marks do not originate in ante-natal influences, as many persons suppose. Their origin is, however, obscure.

Electrolysis, radium, and carbon dioxide ice, are all efficient measures for removing these blemishes. Carbon dioxide ice is the simplest and best means, but can only be applied by a physician who has the proper apparatus.

Radium and carbondioxide ice leave no scar. Removal by the knife, if thorough, is the shortest and least expensive method.

Hiccough in Children

Q. **What remedy should be adopted to cure a child two years of age hiccoughing?**

A. The cause of hiccough is gastric irritation. A hot fomentation over the stomach two or three times a day and the moist abdominal bandage (see index) worn day and night, will be found helpful. Care should be taken not to permit the baby to take its food too rapidly. Massage of the abdomen, especially in the region of the stomach, is helpful. Care to keep the bowels moving freely through the use of baked apple pulp, prunes, and orange juice, and malt sugar, is essential. In case of obstinate hiccough, the stomach should be washed out by means of a stomach tube.

Left-Handedness

Q. **What is the best method for correcting a decided tendency to left-handedness in a seventeen-months-old child?**

A. "Let him alone" is the latest verdict of science. Let him use his left hand, if he will in place of his right. He is constructed that way. He may be trained to use his right hand as others do, but will be able to make more efficient use of his left hand if allowed to follow his natural bent.

From one to four per cent of all human beings are born left-handed. These persons may be easily trained to use the right hand sufficiently for practical purposes, as in eating, in shaking hands, and in other conventional customs in

which the right hand is dominant; but in these cases the left hand is better equipped for such fine work as writing and drawing, and should be permitted to receive the training usually given to the right hand. Life is not long enough for the equal training of both hands, hence we are compelled to specialize in relation to the hand, as well as in relation to occupation.

Bed Wetting

Q. **What is the cause of bed wetting? Can it be cured?**

A. There is an irritable condition of the bladder or of the controlling nerve centers.

For wetting the bed at night a great variety of remedies have been tried, most of which are of no value whatever. The most effective plan that can be pursued is to restrain the patient from eating or drinking for three or four hours before retiring. An eminent physician has also suggested that the use of meat by children encourages the habit. Whipping, scolding, and frightening children will do no good; in fact these measures are likely to do harm by creating a condition of the nervous system that will encourage the very thing which is to be corrected.

A short hot sitz bath taken at bedtime will be beneficial. In other cases, a short general cold bath, concluding with a dash of cold water upon the lower spine, is usually beneficial. Raising the foot of the bed eight to ten inches succeeds in some cases.

Wearing a moist towel covered by a dry flannel bandage about the lower part of the

bowels at night is a very useful measure. To prevent the patient from sleeping upon the back, a good remedy is to tie a knot in a towel and place it about the body in such a way that the knot will come at the center of the back. In cases in which the patient is old enough, and sufficiently intelligent to appreciate moral influence, he should be encouraged to try to overcome the habit. He may be given some simple prescription in which he should be taught to have perfect confidence as a certain cure, since faith will sometimes do much toward effecting a cure when other remedies fail. This difficulty usually disappears with the development of the child.

Worms

_Q._ Are worms in children due to the handling of dogs and cats?

A. There is a certain species of worms that are contracted from dogs. Intestinal parasites much more generally come, however, from the use of flesh food, or of vegetables which have been contaminated. Lettuce, cabbage and turnips are particularly liable to be thus contaminated. All greens and salad vegetables used uncooked, should be very carefully washed and disinfected before serving by soaking five minutes in a 5 per cent peroxide of hydrogen solution.

Earache

_Q._ How may the baby's earache be relieved?

A. Slight attacks of earache may be promptly relieved by the application of heat. A rubber

bag filled with water as hot as the hand can bear but not hot enough to burn, should be covered with a layer of flannel and held next to the ear for half hour or more at a time. If the child becomes restless the cause may be overheating of the head. This difficulty may be overcome by applying a cold cheese cloth compress to the opposite side of the head. Consult a physician.

Whooping Cough

Q. **What is the cause of whooping cough?**

A. Whooping cough is due to a specific germ. The duration of the disease is somewhat indefinite. It usually lasts four to six weeks. It may become chronic and last much longer.

It is very contagious.

A child suffering from whooping cough should drink large quantities of water daily and should be constantly in the open air.

Cleft Palate

Q. **If a child is born with cleft palate, can it be cured, or remedied by operation?**

A. It can be greatly helped by an operation; perhaps entirely cured.

It is just as well to wait until the child is six or eight years of age for such an operation.

It is caused by deficient development, and if allowed to go without attention will affect the speech, and be a great handicap.

Hip Disease

Q. **What is the proper treatment for hip disease in a boy ten years old?**

A. The boy should be put under the care of a reliable surgeon who has had experience in similar cases. Different stages of the disease require different treatment. In many cases rest in bed is necessary. A short, cold, rubbing bath of some sort should be administered twice daily. The application should be brief, the water quite cold. The best method is the cold mitten friction, shower bath, or cold wet-hand rub.

Sun baths are of the greatest value in cases of hip joint disease in children. Rollier, of France, has established an institution where hundreds of apparently hopeless cases have been cured by daily exposure to the sun. Exposures are short at first, but are gradually increased and are continued until the skin is deeply tanned.

Enlarged Neck Glands

Q. **What causes enlarged glands in a child's neck?**

A. The usual cause is tuberculosis. In many instances the infection is derived from infected milk. Enlarged tonsils or adenoids may be the cause.

Chicken-pox

Q. **What treatment should be given for chicken-pox?**

A. This disease is rarely serious enough to require anything more than a spare but laxative

diet of fruits and bran with such fresh foods as celery, lettuce and the juices of fruits, and free water-drinking. Take care to keep the bowels open, and avoid taking cold. If the temperature rises so high as to cause discomfort, one or two wet sheet packs (see index) will generally control it. A moist bandage worn around the abdomen, consisting of a towel wrung rather dry out of cold water, covered with one or two thicknesses of flannel is excellent treatment.

The most serious complication of chicken-pox is inflammation of the kidneys. To prevent this the child should be made to drink water freely. Six or eight glasses a day is none too much.

The Cause of Colic

Q. **Why should a child of six weeks have colicky pains one or two hours daily?**

A. Probably there is something wrong with the mother's dietary. There may be some hereditary weakness of the stomach. It is likely the bowels are constipated. Children often have colic from over-feeding or taking nourishment too rapidly. A teaspoonful of mineral oil emulsion twice a day will relieve the constipation. A warm enema may be given for temporary relief. A hot bag over the abdomen will be found useful.

The Proper School Age

Q. **At what age should a child be sent to school?**

A. It depends upon the child, his health and mental and bodily development, and upon the

school and its environments. No child ought to be deprived of ample opportunity for growth and health of body for the sake of mental culture in his early years. A sound body is the first consideration.

With the school course of study for a guide, an apt mother can teach her boy in an hour or two a day what he would be a whole school day in acquiring under a teacher who has a roomful to attend to.

Increasing a Child's Height

Q. **What will make a child grow taller?**

A. The child should exercise the legs particularly. As much time as possible should be spent in the open air. One of the best exercises is swimming, which combines excellent movements of the arms and legs with the tonic effect of cold water.

Growing children need food rich in lime, such as greens and whole grain preparations. Fine flour bread, polished rice, new process corn meal, and most breakfast foods are deficient in lime, and when used should be supplemented by other foods rich in lime, such as greens, which should be eaten freely daily. Of all foods milk is the most important source of food lime. A growing child requires one quart of milk a day. Care must be taken to keep the bowels active as constipation, with the resulting autointoxication, is a frequent cause of arrested growth in children. Every child should be taught to move the bowels after each meal.

The Proper Weight for Children of Different Ages

Q. **How can one know that a child has the proper weight for his age?**

A. According to Dr. Emmet Holt of New York: "The relation of height to weight is important as indicating the state of nutrition, but considerable variation exists in healthy children. A child's nutrition may be considered below the normal when he is 10 per cent below weight for his height between the sixth and the tenth year, or 12 per cent below from the eleventh to the sixteenth year.

"The best guides to the state of nutrition, and more important than either of the foregoing, is the annual rate of increase in weight and height. The annual increase in weight is from 4 to 6 pounds a year from the sixth to the tenth year, while it rises to an average of 13 pounds in the fifteenth year.

"The annual increase in height varies normally less than weight. The average increase is from 1¾ to 2 inches a year from the sixth to the eleventh year; it rises to its highest point in boys from the thirteenth to the sixteenth year, when it is usually from 2½ to 3 inches a year. In girls, it is highest from the tenth to the fourteenth year.

"Observations on 1,243 school boys between 10 and 16 years of age showed that they increased in weight 1¼ pounds more in six months from May to November than from November to May, and that the gain in height was 0.38 inch more during the first-named period."

Food Principles

Q. **What are the so-called food principles?**

A. The materials of which a breakfast is composed are not homogenous. Food is made up of a variety of very diverse elements, known as food principles of which there are two groups:

1. *Major food principles,* which constitute the bulk of our foods. These are:

a. Carbohydrates, that is foodstuffs made up of the elements carbon, hydrogen and oxygen, or really, carbon and water. Starch, sugar, dextrine and the acids of fruits and vegetables make up this class.

b. Fats, hydrocarbons, substances consisting chiefly of carbon and hydrogen. All sorts of edible animal and vegetable fats and oils belong to this class.

c. Proteins, food substances made up of hydrogen, oxygen and carbon, with the addition of nitrogen, sulphur and phosphorus. White of egg, the lean of meat, the curd of milk, and the gluten of wheat are examples of protein.

All of these substances are combustible, and they are burned in the body, but they are not equally useful as fuels. When starch and fats burn, the combustion products are simple, odorless and harmless carbon di-oxide and water. When protein burns, the products are highly poisonous and foul smelling gases.

The purpose of protein is to supply material for building and repairing the tissues, the machinery of the body.

These major food principles may be classified

then as (1) *Fuel* food principles—starch, sugar, and fats, and (2) *Tissue building* food principles, the proteins.

2. *Minor food principles.*

These are also three in number, viz., salts, cellulose, and vitamines.

The *salts* consist chiefly of lime, soda, potash, magnesia and iron, combined with the principle mineral acids.

Cellulose is found in vegetable food only. It is highly important as a bulk forming element and is necessary to stimulate the food tube to proper activity.

Vitamines are subtle elements in the food which are essential to good nutrition, and in the absence of which various deficiency disorders make their appearance, such as beri beri, scurvy, and probably pellagra and rickets.

Vitamines are easily destroyed by boiling or baking or by long drying. This fact emphasizes the need of a daily and abundant supply of fresh fruit and vegetables which have not been impaired by cooking.

It must also be remembered that vitamines are chiefly found in the outer coverings of seeds and in the germ, and so are not found in fine wheat flour nor in polished rice. Vitamines abound in fruit and vegetable juices, especially the juice of the orange. Green leaves (uncooked) such as lettuce, cabbage, and spinach, are rich in vitamines.

The Soft Palate

Q. **What is the function of the soft palate?**

A. This soft fold of tissue hanging like a curtain at the back of the mouth acts as an inspector of the food, to determine whether it is prepared for swallowing. It determines whether the food has been sufficiently chewed, and whether it has the qualities necessary for nutrition.

When the food has been properly chewed, that is, brought to a soft, liquid consistency, it slips by the food inspector's gate so easily that it appears to be swallowed automatically and without effort.

The nerves of the soft palate seem to possess extraordinary wisdom in relation to the needs of the body and not only observe the way in which the food has been chewed, but also its various dietetic properties, and in a marvelously efficient way cater to the real needs of the body. By this means the inspector gate becomes, to a very large degree, the regulator of the body's nutrition.

The Sense of Taste

Q. **Where is the sense of taste located?**

A. The nerves of taste are distributed to the point and upper portion of the tongue, the lower portion of the soft palate not including the uvula, the back of the soft palate, the epiglottis and even the inside of the larynx. In a child the lining membrane of the cheek, the roof of the mouth and the whole of the upper surface of the tongue are sensitive to taste. As life ad-

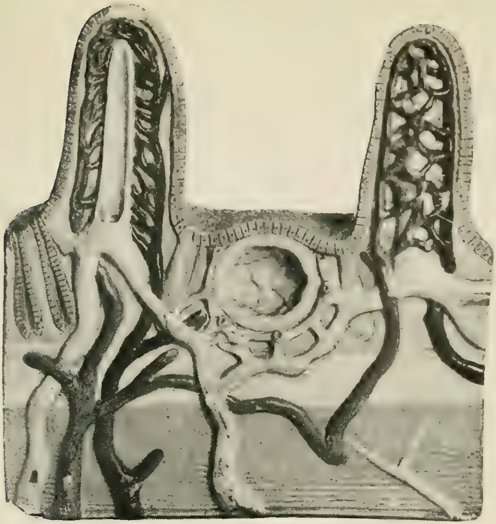
vances, the area covered by the sense of taste gradually diminishes. In very advanced age, the sense of taste almost disappears.

The primary tastes are: sweet, sour, bitter, salty, alkaline and metallic. Oily, aromatic, pungent and astringent flavors are due to a combined stimulation of the senses of taste, smell, touch and temperature.

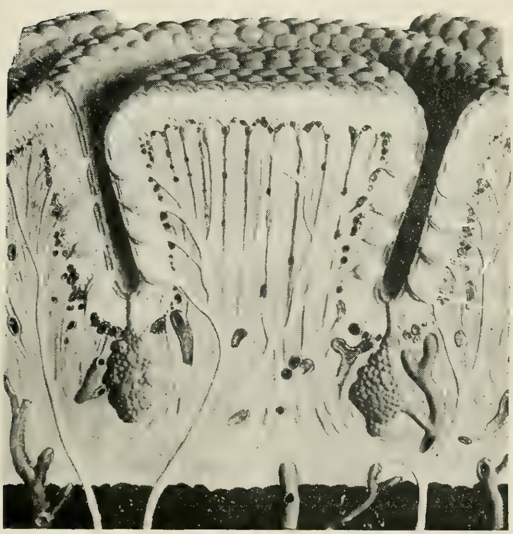
Sweet is perceived by the upper part of the tongue, bitter by the back part. The salty taste is perceived the most quickly. The next most quickly perceived is the sweet, then the sour and slowest of all, bitter. It has been suggested that the stomach also has a sense of taste, but this is not true although the stomach possesses to some degree the sense of feeling. The sense of taste is not lessened by bodily fatigue, which greatly diminishes the acuteness of the sense of smell. The nerves of taste may be deceived. After rinsing the mouth with very dilute sulphuric acid, pure distilled water has a sweet taste. The sense of taste is intensified by contrasts. A very dilute salt solution utterly devoid of taste will increase the sweetness of a sugar solution taken afterwards. A dilute solution of cocaine destroys the sense of taste. Ice water benumbs the nerves of taste, obliterating the flavor of all except sour substances. Chronic catarrh of the nose and throat diminishes the sense of taste as well as the sense of smell. The acuteness of the sense of taste may be greatly increased by education.

Q. **What are the so-called "taste-buds"?**

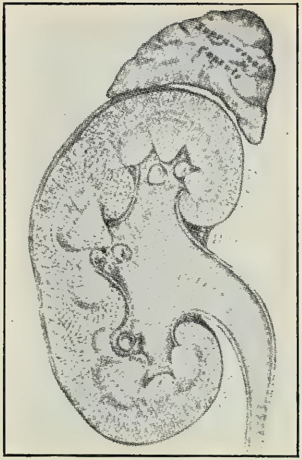
A. The so-called taste buds are curious



Cross-Section of Villi from the Small Intestine
(See page 432)

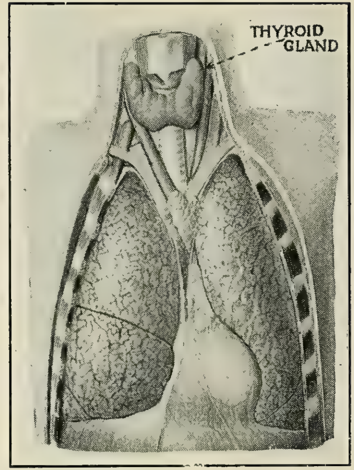


Cross-Section of Papilla from back of Tongue showing Taste Buds at A



A Section of the Kidney, Showing Suprarenal Capsule

(See page 398)



The Lungs, Showing Thyroid Gland

(See pages 440, 484)

little oval bodies scattered over the surface of the tongue and the soft palate. The buds are the end organs or terminal part of the nerves of taste, and are the means by which the gustatory properties of such substances are recognized. While the taste buds are scattered widely over the tongue and palate, they are most numerous at the back of the tongue. Here are found several large papillae, the so-called papillae circumvallate. These papillae are cone-shaped and are attached by the tip of the cone at the bottom of a little hollow in the mucous membrane which is just deep enough to hold the papillae. Each papilla is thus surrounded by a little trench. In the sides of this trench the taste buds are more numerous than in any other locality. The accompanying cut shows a cross section of a papilla and of the little trench in which it is located. The cone shaped bodies arranged in a vertical row inside the trench are the taste buds.

The sense of taste is one of the most interesting of the seven senses, yet for some reason it has been less carefully studied.

All the soluble substances are recognized by the sense of taste. Physiologists tell us that there are only four primary taste sensations, sweet, sour, bitter and salt. It is supposed that there is a separate set of nerves for each of these tastes. Among the reasons for this supposition is the fact that the back of the tongue is more sensitive to bitter, while the tip and the sides recognize most readily sweet and acid flavors. It has been demonstrated also that the individual papillae differ in their recognition of different

tastes. For example, if quinine and sugar are mixed together and the mixture applied to one papilla, the mixture may be recognized as bitter, whereas when 't is applied to another papilla the taste will be sweet instead of bitter. Certain substances when taken into the mouth have the effect of destroying the power to distinguish certain flavors, while other flavors are recognized as usual. For example, the leaves of a certain plant when chewed destroy entirely the bitter and sweet sensation but leave intact the nerves which recognize acids and salt, together with the general sensibility of the mucous membrane to touch and pain.

When a weak solution of cocain is applied to the tongue, it destroys the sense of touch and of pain, but does not effect the sense of taste, so that a tongue which seems to be entirely paralyzed and rendered numb by cocain is still acutely sensitive to acid. Many of the so-called flavors of foods are recognized by the combined action of the nerves of taste and the sense of smell. Without the sense of smell it might be hard to distinguish between the flavor of an onion and that of an apple.

Hunger

Q. **What is the cause of hunger?**

A. Cannon showed several years ago that the sensation of hunger is due to peristalic waves in the stomach, or, what is known as "hunger contractions." These contractions differ from the ordinary muscular movements which take place during digestion. It has been shown by

Rogers and Perrison that hunger contractions are stopped at once by taking acid or sugar into the mouth, or by swallowing water, or a dilute solution of hydrochloric acid or food of any sort; but the same means have no effect upon the ordinary muscular movements of the stomach.

Weight of Ordinary Diet

Q. **What is the weight of an ordinary day's ration?**

A. The weight of the day's ration will depend, of course, almost entirely upon the character of the food selected.

For example, a pound of nuts is capable of furnishing all the energy required by a man engaged in active muscular pursuits. Of course, such a diet would be much too concentrated.

A mixed ration of fruits, nuts, vegetables and such fresh foods as lettuce, celery, etc., will weigh about two and one-half to four pounds.

Calories, or Food Units

Q. **What is a calory or a food unit?**

A. Foods, like all other organic substances, when burned, produce heat. The amount of heat produced by a given quantity of food differs according to the nature of the material and also according to the amount of water and other elements incapable of producing heat which it may contain. When taken into the body, digested, assimilated, and used, foodstuffs produce the same amount of heat and other forms of energy as if burned outside of the body; hence the number

of calories represented in a given foodstuff may be taken as a measure of its food value.

Before a definite value can be placed upon anything there must be a standard or measure for it. When we buy dry goods, we buy them by the yard, the yard being the standard of measure for this kind of goods. When we buy milk, we buy it by the pint, another standard of measure. Thus for all commodities or substances on which are to be placed definite values, there must also be definite standards of value. Accordingly, if the quantities of heat produced by various foods are to be compared, there must be a definite measure for heat; but since we cannot measure heat by length nor by weight, nor by any other of our common standards of measure, it becomes necessary for us to measure it by what it can do. So the standard adopted is the amount of heat required to raise the temperature of one pound of water 4° F. This unit we call a calory.

Food Portion

Q. **What is a food portion?**

A. The term food portion was devised by Prof. Irving Fisher of the Yale University and indicates such an amount of food as will furnish one hundred calories.

The bulk of food required for a portion differs greatly. 100 calories will be furnished by half an ounce of almonds, one of the most nourishing of foods, whereas 33 ounces or sixty-six times as much bouillon, more than a quart, is required to furnish the same amount of actual nutritive material. Practically, 100 calories are fur-

nished by one ounce of each of the following articles:

Rice biscuit, shredded wheat biscuit, buns, corn cake, graham, oatmeal and whole wheat crackers, jelly, dates, figs, wheat flakes, honey, ripe olives, raisins, rice flakes, puffed rice, cheese sandwich, egg sandwich, fig sandwich, zwieback.

Composition of Foods

Q. **What is the composition of the various foodstuffs?**

A. The following table shows the number of food units contained in various foodstuffs as ordinarily served at the table:

Fruits, vegetables, nuts, cereals and dairy products:

Oz. per Serving		Calories per Serving Protein	Fat	Carbohydrate	Total
¼	Almonds	4	35	5	44
5½	Apples	2	7	88	97
6	Apple juice	0	0	102	102
3	Apricots	4	0	45	49
3½	Bananas	5	5	87	97
3	Beet Greens	7	27	11	45
3	Blackberries	3	6	36	45
6	Blackberry juice	0	0	102	102
2¼	Blueberries	2	3	42	47
6	Blueberry juice	0	0	102	102
4½	Blueberry Sauce	4	6	62	72
½	Brazil nuts	9	87	3	99
½	Butter	1	108	0	109
6	Buttermilk	21	7	32	60
6½	Cantaloup	4	0	69	73
1	Celery	1	0	3	4
2¼	Cherries	2	5	42	49
3	Cherry sauce	3	1	72	76
¾	Corn Flakes	8	1	68	77
1	Crackers, oatmeal	13	28	79	120

Oz. per Serving		Calories per Serving Protein	Fat	Carbo-hydrate	Total
2¼	Cream	6	106	11	123
2	Cucumbers	2	1	7	10
3	Currants, red	5	0	43	48
1	Currant jelly	1	0	102	103
3	Dandelions	8	7	36	51
1¾	Dates	4	13	156	173
½	English Walnuts	10	82	7	99
2	Figs	1	16	159	176
½	Filberts	9	83	7	100
3¾	Grapefruit	3	2	44	44
6	Grape juice	0	0	143	143
5	Grapes	2	6	102	110
4½	Hominy Grits	8	2	65	75
1½	Honey	1	0	138	139
1¼	Lettuce	1	1	4	6
1¼	Maple Syrup	0	0	101	101
1	Maple Sugar	0	0	94	94
6½	Milk, skimmed	25	4	37	66
6	Milk, whole	22	61	34	117
⅞	Nut butter	29	104	17	150
⅓	Olive Oil	0	85	0	85
1⅓	Olives, ripe	2	92	7	101
5	Orange	4	3	66	73
4	Peaches, fresh	3	1	42	46
¾	Peanuts	22	74	21	117
4	Pears, cooked	1	3	82	86
4	Pears	2	5	64	71
½	Pecans	6	91	7	104
½	Pine Nuts	20	65	4	89
4	Pineapple, fresh	1	3	44	48
3½	Pineapple sauce	1	6	145	152
4	Plums	4	0	91	95
2¾	Plum sauce	3	0	99	102
3¾	Prune sauce	1	1	95	97
3¾	Quince sauce	1	3	91	95
1	Radishes	1	0	7	8
1	Raisins	3	8	87	98
3	Raisin sauce	6	18	176	200
4	Raspberries, black	7	10	57	85
3¼	Raspberries, red	4	0	54	58
3¼	Raspberry sauce, black	5	7	89	101
3¾	Raspberry sauce, red	4	0	71	75
1	Rice Biscuit	4	1	48	53

Oz. per Serving		Protein	Fat	Carbo-hydrate	Total
		Calories per Serving			
4	Strawberries	4	6	34	44
3½	Strawberry sauce	2	5	95	102
1-5	Sugar (granulated)	0	0	23	23
4	Tomatoes	4	4	16	24
8	Watermelon	3	4	76	83
½	Whipped Cream	1	23	2	26
	MEAT AND FISH				
2½	Beef, roasted	63	183	0	246
2¼	Beef, round	70	44	0	114
6	Bouillon	15	1	1	17
3¼	Chicken, broilers	79	20	0	99
3¾	Clams	37	9	8	54
5	Codfish	94	5	6	105
2¾	Goose	51	257	0	308
3	Halibut (steak)	63	40	0	103
2	Lamb Chops	49	153	0	202
3½	Lamb Leg (roast)	78	114	0	192
3	Liver (veal)	65	40	0	105
2	Lobsters	41	5	1	47
2½	Mutton (leg, boiled)	47	66	0	113
3½	Oysters	35	21	15	71
1	Pork (bacon)	15	91	0	106
2¼	Pork (boiled ham)	51	129	0	190
3	Pork (chops)	45	199	0	244
2¼	Salmon	45	102	0	147
2¼	Shad	24	27	0	51
1¾	Trout	36	45	0	81
1¼	Turkey	23	58	0	81
2½	Veal	52	37	0	89

Diet and Working Ability

Q. **Is working ability increased by the consumption of large quantities of food?**

A. The amount of heat produced by a furnace is nearly in proportion to the amount of fuel introduced but this is not true with the body. The body does not necessarily consume the food fuel as fast as it is supplied. It is a self regulating mechanism and uses only so much energy

material as is needed to make good its necessary losses and expenditures.

The Saliva

Q. **What is the action of the saliva upon foods eaten?**

A. The saliva is one of the most interesting of the several digestive fluids. It contains two ferments, one of which liquifies starch while the other converts starch into the form of sugar known as maltase. Maltase is also produced by the action of the diastase of malt upon starch. Human saliva always contains a certain amount of ferment although the amount differs at different times of the day. The digestion of starch in the mouth begins immediately when the saliva comes in contact with it. The action of the saliva continues in the stomach for one to two hours after the food has been swallowed during which time the greater portion of the food mass remains in the distended left portion of the stomach. As food is taken into the stomach it is arranged in layers, each additional portion entering the center of the mass and so spreading it out and causing a thinning of the outer layers. This arrangement of food in concentric layers or strata facilitates digestion as it affords longer opportunity for the action of saliva, for that part of the food mass lying upon the outside comes in contact with the hydrochloric acid which neutralizes the saliva. After the food passes into the small intestine, however, the saliva is reactivated by contact with the bile and other intestinal fluids so that the action of the salivary

ferments is thus continued in the small intestine. One of the objections to the free use of fluids at meals is the fact that it interferes with the stratification of foods above described and thus lessens the efficiency of the salivary digestion. The observation of Pawlow may also be mentioned in this connection. This physiologist observed that a considerable amount of fluid in the stomach had the effect to increase the amount of hydrochloric acid so the use of fluid at meals interferes with salivary digestion, both by preventing proper stratification and by stimulating the flow of gastric acid.

Recent observations have developed new facts which greatly emphasize the importance of the saliva in the process of digestion. If the action of the saliva upon the starch of the food is not complete the undigested starch taken into the stomach absorbs the pepsin, leaving the hydrochloric acid free in the stomach. This is the natural result since pepsin is necessary to enable the hydrochloric acid to combine with the protein of the food through which its highly acid irritating properties are rendered inactive. This discovery of the absoption of pepsin by starch, explains the observations made long ago that persons suffering from hyperacidity can make better use of dextrinized or predigested starch than of starch in the form in which it occurs in bread, mushes, and other cereal dishes. Zwieback has been in great vogue for centuries at Carlsbad and other European places famous for their success in the treatment of indigestion.

The Saliva Protects the Teeth

Q. **Does the saliva protect the mouth from the action of germs?**

A. Bergman regards the saliva as the best remedy for disordered conditions of the mouth, it being much superior to any sort of gargle that can be employed. He undertakes to increase the flow of saliva by means of various chewing tablets.

In hyperhydrochloria, the production and swallowing of a large amount of saliva is said to achieve remarkably excellent results in a curative way.

It is known that wounds in the mouth generally heal quite readily. Clairmont of Vienna has shown that salivary secretion possesses valuable properties as a cleansing agent, although it has no direct bactericidal action upon such pathogenic organisms as the bacilli of typhoid fever and tetanus, the colon bacillus or pus-producing organisms. A few bacteria were destroyed by contact with the saliva. Clairmont's observations led him to believe that the saliva maintains in the mouth conditions unfavorable for the growth of micro-organisms and that this protective influence may be increased by promoting the flow of saliva and thus washing away micro-organisms which might otherwise fix themselves upon the teeth and gums and set up processes of decay or ulceration.

Recent experiments by Rickert and others show that when the saliva becomes deficient in lime, decay of the teeth begins. This is especially

seen in cases of pregnancy. The probable cause is a deficiency of lime in the food.

The Flow of Saliva

Q. **How is the amount of saliva production regulated?**

A. The amount of saliva formed depends upon the character of the food. Dry and highly flavored foods cause the salivary glands to pour out an abundance of saliva, whereas moist and liquid foods excite the activity of the salivary glands very slightly or not at all.

To insure an abundant outflow of saliva, it is, then, highly important that food containing starch shall be eaten dry, and that it shall be thoroughly chewed, being retained in the mouth for a sufficient length of time to secure the secretion and the admixture of a sufficient amount of saliva to do the work required of this important digestive fluid. If the mastication continues long enough, some portion of the starch is converted into sugar while it is still in the mouth.

Exercise and Digestion

Q. **Does violent exercise interfere with the digestion and the absorption of food?**

A. Experiments made many years ago seemed to show that vigorous exercise interferes seriously with digestion and absorption, but more recently conducted experiments made by Grandeau and Leclerc, Wolff, and S. Rosenberg, upon animals, show that the organic matter of the food is turned to just as good account during strenuous

work as it is during complete and continuous repose.

It may perhaps be otherwise when untrained men suddenly take to violent physical exercise, but even the most strenuous exertions do not impair the utilization of the food taken by persons who are in training.

Digestive Enzyme of Pineapple Juice

Q. **Is the juice of the pineapple of any value as a digestive agent?**

A. In reply to a similar question, an able chemist and authority on diet said:

"There is present in pineapple juice an enzyme which has some little digestive power. The pineapple is a most wholesome and useful fruit. Its value as a digestant and a cure of sore throats is greatly exaggerated. It will take about 1.7 pints of the juice to digest the white of one egg in the most favorable conditions, while one-twenty-eighth of an ounce of the pepsin which is normally present in the stomach will digest about six pounds of egg albumen. Beware of fads."

Food Absorption

Q. **Is food absorbed by the stomach? If not, in what part of the alimentary canal does absorption occur?**

A. Moritz showed that during seven hours only the minutest quantities of animal proteins were absorbed from the stomachs of dogs, and practically none of the proteins of milk. The principal duty of the stomach appears to be to

act as a reservoir from which the food may be doled out to the intestine. Even liquids are absorbed from the stomach only in small amounts. Absorption takes place chiefly from the small intestine which absorbs between five and six quarts daily.

The colon absorbs only a few ounces.

Q. **How may the absorption of food be encouraged?**

A. Experiments have shown that the rate of absorption by the intestine depends largely upon the degree of pressure within the abdominal cavity. The effect of increased pressure upon the rate of absorption of liquids is the same as an increase of atmospheric pressure on the passage of liquids through a filter. The intra-abdominal pressure is influenced by several factors, especially the tone of the intestinal walls, the weight of intestinal tract, the contraction of the intestinal muscles, the pressure of the abominal muscles and the diaphragm in breathing and especially in deep breathing. The last two factors, which are perhaps the most powerful of all, may be readily controlled.

When the abdominal muscles are weak and the breathing shallow, absorption is necessarily slow. The strength of the muscles may be increased by gymnastic exercises and by applications of electricity. Automatic exercise of the abdominal muscles is especially useful. The diaphragm may be brought into useful action by deep breathing. For many years the writer has recommended to his patients the practice of deep

breathing after meals, and has found this an efficient means of relieving the sensation of heaviness or weight in the abdomen; this is probably due to accumulation of blood in the abdominal vessels and interference with absorption. An excellent method of encouraging absorption, is to practice deep breathing while lying upon the back with a sandbag, or weighted compress, upon the abdomen. The weight of the sandbag may be ten to forty pounds, according to the strength of the patient. Lying on the face also encourages absorption. The small boy lies over a barrel when his stomach aches.

The Digestion of Fat

Q. **Does the stomach digest fat?**

A. Modern researches in digestion have demonstrated that the stomach does only the preliminary work of digestion, leaving the principal part of the work to be done in the small intestine. The carbohydrates are quickly liquified in the stomach by the saliva, then allowed to pass out into the intestine. Protein is held back and doled out a little at a time as the intestine is able to deal with it. The same is true of fats. The experiments made by Pawlow's students serve to show that the closing of the pylorus, with the consequent cutting off of the flow of the fat to the intestine, follows the direct contact of fat with the mucous membrane of the small intestine.

Metabolism

Q. **What is metabolism?**

A. Metabolism is a general term applied to indicate the various forms of tissue change and

chemical activity of the body. These changes consist chiefly in reparative processes by which the integrity of the body cells and tissues is maintained, and in the consumption of material in the production of heat to maintain the body temperature, and to supply the energy for body work.

Is the Stomach Essential to Life

Q. **Is it possible for a person to live without the stomach?**

A. The human stomach has been successfully removed in a few instances and the patient has survived in two cases for several years. In numerous cases so large a part of the stomach has been removed that the small remainder was wholly inactive as a digestive organ so it is known that life can be maintained without the stomach. It is important, however, to know that persons whose stomachs have been removed or whose stomachs are crippled by disease so that they no longer secrete hydrochloric acid can continue in health only by careful regulation of the dietary. The stomach is the only organ which is able to digest connective tissue. This is accomplished through the action of hydrochloric acid and pepsin. When the stomach ceases to make hydrochloric acid or in case the stomach is rendered inactive by a surgical operation, it is manifestly necessary that the patient should strictly abstain from the use of meats. If meat is taken under such conditions, connective tissue being undigested, collects in the colon where it undergoes decomposition, producing highly

putrid stools and hence autointoxication in consequence. All persons who suffer from hypopepsia, that is, whose stomachs do not make hydrochloric acid, should on this account carefully exclude flesh foods of all sorts from their dietary.

Colon Function

Q. **Does digestion take place in the colon?**

A. Modern physiologic research shows that the chief function of the colon is to receive waste and indigestible substances and remove them from the body. The first part of the colon is quite active in the absorption of water. Digestion and absorption of protein and fat are practically confined to the small intestine. Magnus-Levy states that the digestion and absorption of carbohydrates and other food principles is carried out completely in the small intestine.

Sleep and Digestion

Q. **What is the effect of sleep upon digestion?**

A. The influence of sleep upon digestion has been studied by Schule. Two healthy persons were given test meals. One was allowed to go to sleep directly after the meal, the other kept awake. By means of a stomach tube the contents of the stomach were withdrawn and examined. Next the experiment was reversed, as regards the two subjects, and repeated many times. Schule found that the effect of sleep during digestion is to increase the acidity of the gastric juice and to decrease the

motility, or muscular activity of the stomach. The increased acidity of the gastric juice was believed by the investigator to be due to irritation resulting from the prolonged retention of the food in the stomach. Schule observed that resting in a horizontal position after eating encouraged digestion without an increase of acidity, but it was necessary that the patient should remain awake, as otherwise the stomach, became less active than normally, food was too long retained in the stomach, an excess of acid was formed, and the stomach was irritated and thereby damaged.

This interesting observation explains the frequency of catarrh of the stomach among those who eat hearty meals late at night. Eating the heartiest meal of the day at half-past six or seven o'clock, or even later, is unquestionably damaging to digestion, and a prolific cause of chronic gastritis and other digestive disorders. No food should be taken within three or four hours of retiring. This allows the stomach an opportunity to complete its work and empty its contents into the intestine. Sleep does not interfere with intestinal digestion.

Appetite Juice

Q. **What is appetite juice?**

A. By many varied experiments Pawlow demonstrated most conclusively that the stimulation of the gustatory nerve by contact with agreeable foodstuffs gave rise to an abundant secretion of highly active gastric juice while the food is still in the mouth. This action begins

within five minutes after food first comes in contact with the gastric mucous membrane. Gastric juice produced in this way by contact by foodstuffs with the mouth surfaces is called by Pawlow, appetite juice, because it is produced only when the substances eaten are of agreeable flavor and when there is a relish for them. The effect is evidently brought about through certain nerve centers in the brain, by connection with which the gustatory nerves reflexly excite the gastric secretion. Pawlow and others have observed that fear, anger, disgust, stop the secretion instantly, while sight and smell of agreeable foodstuffs in the presence of hunger, as well as by actual contact of food with the mouth, may give rise to an abundant flow of appetite juice.

Digestibility of Raw Starch

Q. **Is raw starch digestible?**

A. The action of saliva and the pancreatic juice upon cooked starch is very rapid. This is not the case, however, with raw starch.

In the raw state starch granules are surrounded by an envelope of cellulose. The saliva penetrates this envelope very slowly, hence the action of the saliva upon raw starch is correspondingly slow.

The pancreatic juice is somewhat more energetic in acting upon raw starch, but digests it slowly; consequently the digestibility of starch very largely depends upon the cooking. Imperfectly cooked or imperfectly chewed starch foods may pass undigested into the feces (whole or broken rice, beans or oats). This may be true

of improperly made bread. Some undigested and unabsorbed starch in the colon is an aid to bowel action and combats putrefaction in the colon.

Glycogen

Q. **What is glycogen?**

A. Glycogen is animal starch. When starch, sugar and like substances are digested in the intestine, they are after absorption taken to the liver where, to prevent the immediate entrance into the blood of a great excess of these materials which are chiefly useful for fuel, the sugar is transformed into a substance closely resembling in composition a vegetable product, starch. Glycogen like starch is insoluble. Hence, it may be stored in the liver in considerable quantities until needed for use. Glycogen is also stored in the muscles. The liver and the muscles are the two great depositories of glycogen in the body, although every living cell contains a small amount of glycogen. When fuel is needed, the glycogen is again transformed into sugar, dextrose, which constitutes the fuel of the body. By the burning of glycogen the body is kept warm. Muscular work is supported by the energy set free by the burning of sugar just as the work of a steam engine is performed through the energy obtained from coal. It is evident that glycogen is a highly important substance. When it becomes exhausted the bodily forces fail. The heart consumes glycogen with every beat. Without glycogen the heart could not beat and no muscle in the body could contract. According to

Schoendorff, the body contains about four per cent of glycogen. The natural source of glycogen is starch or sugar. It is on this account that our natural foodstuffs contain so large a proportion of these substances.

When no starch or sugar are eaten, the body makes glycogen by splitting the protein molecule. By this means, about half the weight of protein may be converted into glycogen. The other half of the protein is converted first into ammonia then into urea. The fuel value of protein is then only half its face value, and the body is taxed in the disposal of the large amount of poisonous waste. It is evident, then, that protein is a very poor fuel.

Gastric Pain

Q. **What is the cause of gastric pain?**

A. Gastric pain is usually due to contractions of the pylorus. These contractions are most active during fasting. When food is present in the stomach, the movements of the stomach are slow and rhythmic, occurring usually at the rate of three to five contractions per minute. When the stomach becomes empty, the contractions are more active and vigorous, and when they become strong enough to be noticeable a sensation of hunger is produced. Still more violent contractions give rise to pain. Very strong contractions of the pylorus are highly painful. Pain due to this cause is usually relieved by the taking of food. Pain occurring in the morning before breakfast, or when some hours have elapsed since the last meal, is usually due to stomach contractions. This pain is

quickly relieved by taking some light food into the stomach, such as rice or rice gruel. In many cases an apple, a bunch of grapes, or any other simple food will afford almost immediate relief.

Rest and Disinfection of the Stomach

Q. **Does the stomach require rest?**

A. The stomach, like every other organ of the body, requires rest. The heart takes a rest after each beat. The total time spent in rest by the heart is in fact greater than the working time. The stomach works continually while carrying on the work of digestion. Its glands work, forming digestive fluids; its muscles work, mixing the food with the digestive fluids, and the muscles of the stomach pass the partially digested food along to be further acted upon in the intestine. Rest is found to be especially necessary to give the stomach an opportunity to disinfect its mucous surface. The hydrochloric acid found in the gastric juice is an excellent disinfectant. When combined with the food, its power to destroy germs is lost altogether. After the stomach is empty, at the completion of the digestion of a meal, the cleansing, disinfective action of the gastric juice becomes efficient. In the feeding of children, as well as adults, the stomach must remain empty for one hour between feedings, so as to allow it to become properly cleansed and ready for the next meal. The fasting stomach contains two-thirds of an ounce to an ounce of acid gastric juice.

The Acid of the Gastric Juice

Q. **What is the acid found in the gastric juice, and how much is normally present?**

A. Pure gastric juice contains half of one per cent of hydrochloric acid. There is little or no variation in the composition of the gastric juice as it is secreted. When the gastric juice contains less than half of one per cent of acid, it is because the acid has been neutralized by the reflux of bile and other alkaline fluids from the intestines. In case of hyper-acidity, the gastric juice secreted is not more acid than normal. The acidity is due to the fact that there is an interference with the normal regurgitation of alkaline fluids which normally reduces the acidity of the gastric contents to less than half the original acidity. That is, the amount of acid is reduced by this neutralization process from five parts in one thousand to two parts.

Q. **Is gastric juice found in the stomach only during meal-time?**

A. No. "The stomach contains acid gastric juice, even in the intervals between digestion. The quantity is usually two-thirds of an ounce to an ounce. This is evidently a provision of nature for preventing the development of becteria in the stomach. Bacteria are constantly being swallowed from the nose and mouth, and the constant presence of an antiseptic and a germicidal fluid in the stomach is necessary to prevent the stomach from becoming infected with moulds and germs of various sorts."

Q. **What amount of gastric acid is produced daily?**

A. The amount of gastric acid formed in the stomach varies with the habitual diet. If a person who usually takes a small amount of meat, takes a large meal of meat, the stomach will not be able to secrete enough acid to combine with all the protein. If the diet is persisted in, however, after a while the stomach will adapt itself to the diet and produce more hydrochloric acid. On the other hand, if an athlete who is accustomed to eat a large amount of meat, eats a meal containing very little protein, the amount of acid secreted will be greatly in excess.

If the meat-fed athlete changes his diet to a low protein standard, after a time the secretion of hydrochloric acid will gradually fall to the normal amount.

The total secretion of hydrochloric acid for a day may vary from one-half ounce to two ounces, varying with the diet, as above indicated. Intestinal toxemia causes an excess of acid. In achylia no acid is formed.

The Use of the Acid of the Gastric Juice

Q. **Of what use is hydrochloric acid in the stomach?**

A. Hydrochloric acid serves a great variety of useful purposes in the process of digestion. Laboratory experiments have shown that the acid of the stomach,—

1. Converts the protein into peptone.
2. Stimulates the secretion of the gastric ferments.

3. Activates the gastric ferments.

4. Opens the pylorus.

5. Closes the pylorus, after entering the duodenum.

6. Disinfects the stomach.

7. Aids the development of secretin which stimulates the activity of the pancreas and the liver.

8. Stimulates the flow of bile.

In the absence of hydrochloric acid, pepsinogen is formed and may be activated by the organic acids produced by bacteria or by the acid salts of the food.

9. Activates the pancreatic juice.

The various organic acids activate pepsin, but hydrochloric acid is superior to all the others as a zymo-excitor. The reason for this is not understood.

Bile in the Stomach

Q. **What is the cause of bile in the stomach?**

A. It is possible that bile and other secretions pass into the stomach much more frequently than is generally supposed. In dogs, the passage of bile into the stomach occurs very frequently, especially when they are fed large quantities of fat. When the stomach produces an excess of acid, bile sometimes enters the stomach to neutralize the excess of acid. When the stomach is empty, the pylorus is often open; thus bile is permitted to pass into the stomach.

Ulcers of the Stomach

Q. **Are ulcers of the stomach and duodenum curable?**

A. That ulcers of the stomach and duodenum are curable is clearly shown by the fact that scars left by healed ulcers are often found in the stomach and duodenum after death. Numerous cases are on record also in which patients who have suffered from severe gastric ulcer have recovered permanently. Without doubt the majority of cases are curable by the application of proper means. In general the measures which are of essential service are the following:

1. The patient must rest in bed or in a horizontal position from one to three weeks.
2. All food should be withdrawn for two or three days, sometimes even longer when severe hemorrhages have occurred.
3. If the secretion of acid continues although food is not given as shown by pain or other symptoms indicative of the presence of acid, carbonate of soda should be given in sufficient quantity to neutralize the acid. When the acid is completely neutralized, the pain will usually cease.
4. After two or three days of abstinence small quantities of bland food are given. The amount of food is increased from day to day and as the quantity is increased the interval between feedings is lengthened.
5. Olive oil and perfectly fresh sterilized and unsalted butter are used in as large quantities as the patient is capable to bear as a means of preventing the formation of gastric acid.

6. Salt is excluded from the dietary.

7. Liquids are taken only in very small quantities, a few sips at a time. When a tumblerful or more of water is taken, the effect is to cause the stomach to pour out a quantity of acid, hence large quantities of liquids must be avoided.

8. Care must be taken to move the bowels three times a day. Bowel movements may be encouraged by the use of paraffin oil and agar-agar. Later sterilized bran may be used instead of agar-agar.

9. A fomentation over the abdomen three times a day followed by a cold mitten friction is a measure of great value in promoting the comfort of the patient.

10. The ill effects of confinement in bed may be counteracted by massage. It is also important to keep the patient in the open air as large a portion of the twenty-four hours as it is possible to do.

Gastro-enterostomy

Q. **What is the operation known as gastro-enterostomy?**

A. In this operation a loop of the intestine is attached to the stomach and an opening made between the stomach and the intestine so that food can pass from the stomach into the small intestine without passing through the pylorus or duodenum. This operation is rarely indicated except in cases in which the plyorus has become obstructed by an ulcer, cancerous growth, or some other cause. The operation is sometimes performed for relief in cases of ulcer of the duodenum.

Achylia

Q. **What is achylia?**

A. Achylia denotes a condition in which the stomach glands have ceased to produce gastric juice.

The gastric acid is necessary for the digestion of connective tissue and gluten. Gastric acid also regulates the closing and opening of the pylorus. When absent, the pylorus remains open and the food passes out of the stomach quickly. This is the explanation of those cases of diarrhoea in which food is passed undigested soon after it is eaten, often within an hour or two.

Achylia is usually the result of long continued over-stimulation of the stomach. It is most common in persons who have made free use of tea or coffee, condiments, or alcoholic beverages, or who have been large meat eaters. Achylia follows chronic gastritis.

There are two forms of achylia:

(a) Achylia of nervous origin in which the administration of hydrochloric acid in sufficient amount is followed by a secretion of pepsin.

(b) Achylia accompanying organic disease of the stomach, cancer and atrophic gastritis in which the giving of hydrochloric acid is not followed by the secretion of pepsin for the reason that the secreting glands have been destroyed. This fact may often be of use in diagnosis.

In cases in which the motor functions of the stomach are preserved, and bacterial action in the stomach is suppressed, life may be maintained through intestinal digestion if the diet is

carefully regulated. It is essential that the food should be well chewed and that meats of all sorts should be carefully avoided.

Remedy for Achylia

Q. **What remedy would you suggest for the condition known as achylia?**

A. This is an exceedingly important question. The number of persons suffering from achylia, a condition in which the stomach makes no gastric acid and often no pepsin, is becoming increasingly common. This condition often precedes cancer of the stomach, the occurrence of which is rapidly growing in frequency. A person suffering from achylia is much more likely to suffer from typhoid fever, cholera, and other infectious disorders of the alimentary canal than a person whose stomach provides the normal supply of acid gastric juice, for the reason that the acid of the gastric juice owes its acidity to hydrochloric acid, a substance possessed of very active disinfectant or germicidal properties.

There are three important things which persons suffering from achylia may do to obviate the several dangers that are mentioned above. These are, first, to adopt a strict anti-toxic diet, which means to exclude flesh foods of all kinds, including fish, fowl and shell-fish. In many cases it is necessary to exclude eggs from the bill-of-fare, while in not a few instances milk, if taken at all, must be used sparingly. The more exclusively the bill-of-fare is made up of foods derived from the vegetable kingdom the better. Foods capable of undergoing putrefaction should

be discarded. Milk, if used at all must be taken as buttermilk. Fats must be eaten sparingly, and only in sufficient quantity to meet the actual needs of the body.

The amount of hydrochloric acid required is considerable, much more than the amount ordinarily taken. The amount of acid formed by the stomach daily is the equivalent of about one teaspoonful of ordinary hydrochloric acid, or muriatic acid. To take this amount of acid in its ordinary form, or to dilute it with water, is practically impossible, on account of its intense acid and corrosive character. It has been discovered that the acid may be made to enter into a loose combination with protein so that it may be swallowed into the stomach in any quantity desired without injuring the teeth or throat. In the stomach the loose combination is broken up, and the acid becomes active and promotes the functions for which it is required.

Such a preparation, known as acidone, has been employed for a number of years and with great profit to those who have used it. Acidone is a powder, a compound of hydrochloric acid with the gluten of wheat. A dessert-spoonful is taken mixed with the food, or with porridge at the beginning of each meal.

Persons whose gastric glands are degenerated so that achylia has become a fixed condition should make use of acidone, or some similar preparation, at every meal, and should continue to do so indefinitely.

Heaviness of the Stomach

Q. **What is the best means of relieving heaviness in the stomach?**

A. Persons who suffer from heaviness after eating should lie down and rest for three-quarters of an hour or an hour after eating. It is a good plan to place a hot water bag over the stomach and to practice deep breathing.

Abnormal Appetite

Q. **What is the meaning of a craving to eat abnormally at meal time and between meals?**

A. An abnormal condition of the sympathetic nervous system controlling the stomach. If care is taken to thoroughly masticate the food, this difficulty will probably disappear.

Use of Stomach Tube

Q. **How frequently can the stomach tube be used without injury?**

A. In some cases the stomach tube may be used daily or even oftener, but in general the frequent use of the stomach tube should be avoided, if possible. If necessary to use the tube daily for a short time, say a week or two, the intervals should be greatly increased, until finally discontinued.

Hypopepsia

Q. **What is the cause of hypopepsia?**

A. Failure of the stomach to make gastric juice may result from an impoverished state of the blood and depreciation of the general bodily

forces; or it may be the result of inflammation, or of cancer or some other form of degeneration. Hyperacidity in which there is an excessive secretion of gastric juice, is generally followed in time by hypopepsia, or apepsia through exhaustion of the gastric glands. An overworked organ is almost certain to undergo degeneration sooner or later.

Starch and Sour Stomach

Q. **How does starch cause sour stomach?**

A. The idea of sour stomach or acid dyspepsia being due to fermentation is a mistake. As a matter of fact, fermentation is very rarely the cause of sour stomach. The real cause is an excess of free hydrochloric acid in the stomach. This excess may be due to several things:

1. An excessive secretion of acid;
2. A deficient secretion of "diluting juice" to reduce the strength of the strong acid secretion, and
3. Some interference with the digestive process by which the acid through the action of pepsin is made to combine with the protein or albumin of the food, thus losing the properties of a free acid.

Maxwell has shown that ordinary cooked starch absorbs pepsin. This fact probably explains the experience of many persons who suffer from hyperacidity and observe, after a meal of starchy foods, the acid is likely to be increased. It is possible that the starch may absorb the pepsin and thus interfere with gastric

digestion of proteins, the hydrochloric acid being left over and uncombined in the stomach, producing hyperacidity. After the saliva has acted upon the starch, rendering it completely soluble by conversion into dextrin and sugar, it is no longer capable of absorbing the pepsin. This action of saliva is, perhaps, one of its most important features in digestion. Halta has made the observation that tannic acid, even in small quantities, prevents the action of saliva upon starch. This is the explanation of the inquiry arising from the use of tea and coffee, both of which contain considerable amounts of tannin. It has long been known that the use of tea and coffee encourages gastric acidity. The caffeine which they contain also stimulates the gastric glands.

Digestive Anaphylaxis

Q. **What is digestive anaphylaxis?**

A. Digestive anaphylaxis is the term applied to certain forms of sickness following the eating of certain foods, chiefly urticaria, or nettle rash, and headache.

MM. Pagniez and Vallery-Radot have within the last three years made known a number of most interesting observations which seem to show very clearly a close association between the form of headache commonly known as migraine and food poisoning due to sensitization to certain food substances. These observers have shown that urticaria following the use of certain foods is due to the same cause. The attacks of headache or urticaria usually occur

within two to four hours after the food is eaten. Animal foods are the most likely to be the cause of an attack, especially meats, eggs, milk, fish, lobster, and oysters.

The observers found that by giving a small quantity of the particular food involved an hour before a meal at which it was to be eaten, the usual unpleasant effects were prevented. That is, in cases in which the use of milk, lobster, or fish caused the urticaria or headache, it is only necessary to take a small amount of milk, lobster, or fish an hour in advance of a meal containing the offensive article to prevent the ill effects.

In case the particular article which causes the disturbance is not known, a half gram (8 grains) of peptone is given an hour before the meals with equally good results.

After carefully following this treatment for a few weeks, the sensitization seems to be cured and the difficulty disappears.

The Pancreas

Q. **What is the function of the pancreas?**

A. The pancreas is a gland, the most complicated gland in the body; in fact it is a sort of double gland. It has two separate and distinct structures which are closely interwoven. One of these produces an internal secretion which aids the muscles in burning up sugar which furnishes energy for work and to maintain the body temperature. This is the so-called internal secretion of the pancreas. The pancreas also has an external secretion, pancreatic juice, which contains

six ferments, various important activators, and alkali in the form of bicarbonates.

The alkaline secretion of the pancreas is reciprocal to the acid secretion of the stomach.

The Pancreatic Juice

Q. **By what means may the pancreatic secretion be increased?**

A. An increase of acids in the food, increases the quantity of the pancreatic secretion.

Fats are a very positive stimulant of the secretion.

The quality of the pancreatic juice is also influenced by the food. On this account persons suffering from achylia should make free use of acid fruits.

Peristalsis

Q. **What is peristalsis?**

A. By peristalsis is meant the movements of the intestines by which the food is moved along and reduced, and wastes discharged from the body.

Gastric Juice

Q. **How is the gastric juice produced?**

A. Gastric juice is a special fluid produced by certain glands of the stomach.

Each food generates its own gastric juice. Pawlow has shown that each natural food contains subtle elements which act upon the nerves with which they come in contact in such a way as to cause the digestive glands to secrete fluids exactly adapted to the digestion of the particular food in question. This action is due in part to

the flavoring substances of food, and in part to little-known substances that are known as *peptogens*.

The gastric juice produced by different food substances varies greatly in both quality and quantity. Milk produces the least active digestive fluid.

Meat produces a strongly acid digestive fluid. Bread produces during a long period a moderately acid but highly active gastric juice.

Represented numerically, the digestive value of the juice produced by the substances named, according to Pawlow, stands as follows: milk, 11; meat, 16; bread, 44.

Gastric Examination

Q. **How can one determine whether he has an excess of hydrochloric acid or a deficiency?**

A. The presence of an excess or deficiency of hydrochloric acid in the gastric juice can be determined only by taking a test meal and having an analysis made by a competent chemist. In general, however, it may be said that acidity occurring within two or three hours after a meal is the result of an excess of acid in the gastric juice and not of fermentation.

Hyperacidity

Q. **What are the causes of excessive acidity of the stomach?**

A. The immediate cause of excessive acidity of the stomach is generally an excessive formation of hydrochloric acid. There may be sev-

eral causes for this. Probably the most common cause is an inactive state of the bowels, or chronic autointoxication. Poisons formed in the intestine and absorbed, being excreted into the stomach, over-excite the gastric glands. Another cause is hasty eating, in consequence of which food is retained for too long a time in the stomach, giving rise to excessive irritation of the mucous membrane.

The free use of meat is perhaps the most important of all the causes which can be mentioned.

The soluble substances of the meat, which give to it its peculiar flavor, are most powerful stimulants of the gastric glands. Pawlow showed that the gastric juice produced by eating meat is much more acid than that produced by bread, milk and other food substances. Copious drinking at meals and the use of condiments may also give rise to acidity.

Sour stomach was formerly supposed to be due to fermentation of the gastric contents. This condition, known as hyperacidity, or hyperchlorhydria, is now found to be due to an excess hydrochloric acid in the gastric juice. The gastric juice, instead of containing two or three parts in one thousand of acid, may contain double this amount. The cause appears to be an over-stimulation of the gastric glands. In the majority of cases, this over-stimulation appears to be the result of the free use of flesh foods, or constipation, or these two causes combined.

Pawlow, the great physiologist of St. Petersburg, demonstrated in experiments with dogs

that a diet of lean meat extracts, or bouillon, or animal broths, would cause the stomach to produce very highly acid gastric juice, more acid than any other food stuffs.

Pawlow also showed that the act of chewing stimulates the stomach through the gustatory nerve, causing the stomach to produce gastric acid even before the food has been swallowed. This so-called "appetite juice" constitutes an important part of the total gastric juice secreted by the stomach.

The following is a list of agents which scientific research and clinical observation have shown to cause an excessive secretion of acid by the stomach:

chewing	strong flavors
lean meat	tea and coffee
meat extracts	alcohol
animal broths	carbonated water
peptone	condiments
cane sugar	bitter drugs
dextrine	constipation
acids	gall bladder disease
butyric acids	salt
(rancid fats)	hunger
water	

The masterly experiments of Pawlow showed that certain foods and conditions greatly lessen the production of gastric acid. Among the chief of these are oil, especially olive oil, soft foods (purees), a saltless diet, bland foods, great fatigue, fever.

Diet in Hyperacidity

Q. **Please outline a diet that will remedy this condition.**

A. Both liquid foods and dry foods should be avoided. Everything should be taken in the form of a puree. The food should be chewed very little. Chewing stimulates the stomach and produces an excessive amount of appetite juice which is highly acid. Wholesome fats, such as sterilized butter, cream and vegetable fats should be freely used. One or two teaspoonfuls of olive oil should be taken just before each meal. The administration of liberal quantities of pure gluten one or two hours after eating is an excellent remedy. The gluten absorbs the acid as effectively as does soda, and has this advantage, that it does not in any way injure the stomach. The bowels should be made to act three or four times a day, but laxatives must be avoided, as these irritate the stomach and the small intestine. Cereals eaten should be well dextrinized for this reason. Granola, zwieback and browned rice especially useful.

Fermentation in the Stomach

Q. **What is the cause of fermentation in the stomach, and does fermentation take place in a healthy stomach?**

A. No. Examinations of the gastric juice made in many thousands of cases in the laboratory of the Battle Creek Sanitarium, demonstrated many years ago that fermentation of the gastric contents is a very rare event. The

writer of this became convinced many years ago that fermentation occurs in the stomach only in cases in which there is obstruction of the pylorus, so that the foodstuffs are retained much beyond the normal time. Saxl, a German investigator, has recently published the results of a research in which this subject is minutely studied. He has demonstrated that in the normal stomach no fermentation takes place, even when yeast is taken in considerable quantity along with starchy food.

The Alkali Habit

Q. **Does taking soda or magnesia to relieve sour stomach do harm?**

A. Yes. Often great injury. Thousands of persons habitually make use of soda or magnesia to relieve acidity after meals. The immediate relief afforded leads to a repetition of the remedy and the formation of a habit. Many physicians are accustomed to instruct their patients to use alkalies for the purpose named, with no word of caution as to possible injury from long-continued use of the drug.

Studies by Crohn, Rehfuss and others have shown that alkalies used in this way may do very great harm. In normal digestion the contents of the stomach are acid. The nerves of the stomach which control the work of the stomach, regulate the secretion of acid so as to maintain the right degree of acidity. When soda is given, the glands secrete more acid to neutralize the alkali, and thus may be easily overworked and worn out. This is, in fact, the

ordinary effect of the systematic use of alkalies. Some experiments have shown that when alkalies are regularly and freely given, the glands may within two weeks become so completely exhausted that they cease to secrete altogether. When this becomes a permanent condition the patient has achylia, a condition worse than hyperchlorhydria.

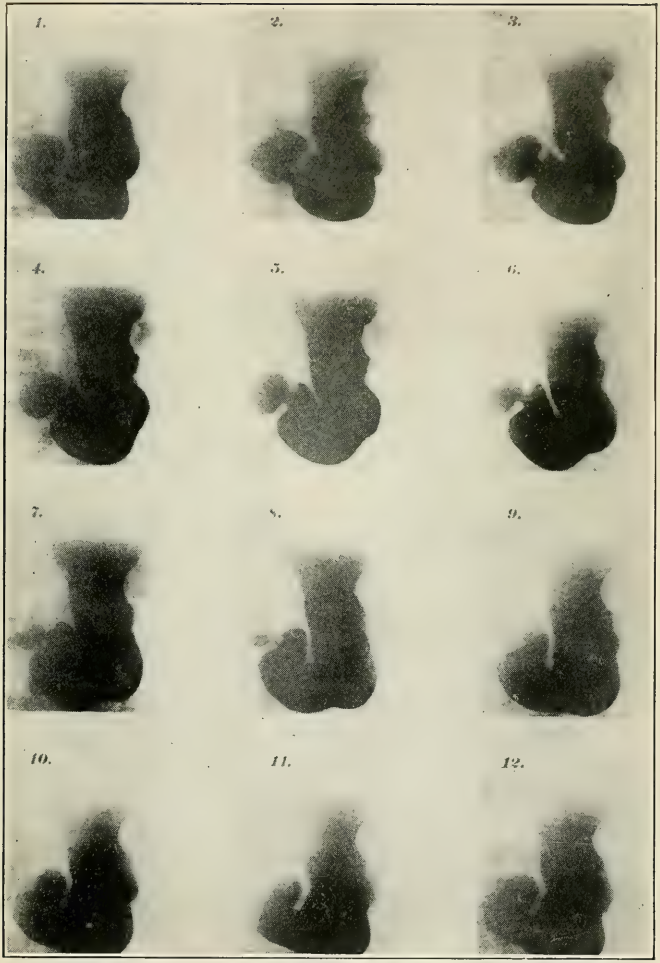
The cause of gastric acidity must be removed. Flesh foods, condiments, and probably constipation cause acidity, also free water drinking at meals, and the use of meat extracts and bouillons.

Movements of the Stomach

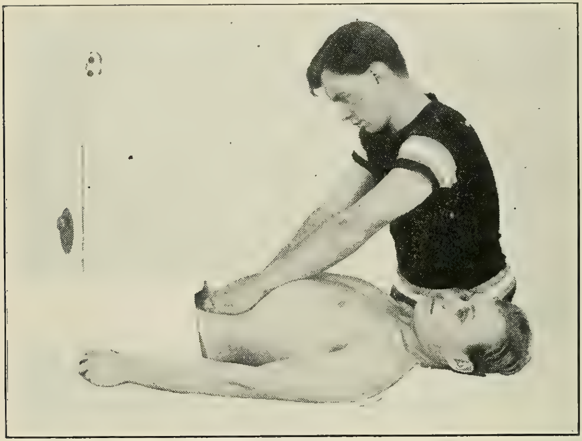
Q. **What are the movements of the stomach?**

A. The cardiac portion of the stomach is not subject to regular movements during digestion. It remains quiescent, a fact which permits of the orderly stratification of the foodstuffs, the last portions eaten entering the center of the globular mass which is formed in the cul-de-sac. Peptic digestion goes on at the surface of the mass, while the salivary digestion proceeds in the center and may continue for two or three hours from the beginning of the meal. As fast as the food is liquefied at the surface of the alimentary mass it goes through the pylorus where it is mixed with the pyloric secretion containing pepsin, which begins its work in the stomach and continues in the intestine.

The movements of the stomach are not confined to the pylorus. Infrequent rhythmical move-



Moving Pictures of the Living Stomach



Kneading the Colon

ments occur in the pre-pyloric portion, but the pyloric portion contracts regularly every ten seconds during digestion, making 2500 to 3000 contractions during the digestion of a meal. The pyloric movements begin as soon as the liquefied portions of the food reach this part of the stomach. If peptone is introduced into the stomach, the pylorus movements begin immediately. Introduction of meat into the stomach induces no movement. Fear and anger arrest instantly the movements of the stomach when in full activity.

When the stomach is empty, rhythmical movements occur every two hours, lasting twenty to thirty minutes. These movements start in the stomach and extend to the entire intestine and are accompanied by a slight secretion of gastric juice, bile, pancreatic and intestinal juices. These movements are absent during digestion and disappear during long fasts. The stomach is controlled both by the sympathetic and pneumogastric nerves. In the sympathetic nerves the inhibitory fibers predominate; in the pneumogastric nerves the excito-motor nerves predominate, although the inhibitory nerves are present. In fasting the excito-motor influence of the pneumogastric diminishes rapidly and disappears wholly at the end of three days, so that the stomach is wholly under the influence of the inhibitory functions of the sympathetic and pneumogastric nerves. This probably accounts for the fact that at the end of the first three days fasting persons experience much less inconvenience than before this time, also for the intestinal inactivity which is present when fasting.

There are various measures by which the gastric movements may be excited to increased activity. Water at a temperature of 100° to 102° F. stimulates the action of the stomach. This is probably the reason that water at this temperature encourages vomiting. Water at a higher or lower temperature lessens gastric activity. Water at a temperature of 41° F. arrests all movements of the stomach and prevents the action of other stimulants. This is clearly a good reason for prohibiting the use of iced drinks and frozen foods of all sorts. Faradic currents cause contraction of the gastric walls. More efficient contractions are secured by a slowly alternating sinusoidal current. Gastric contractions are also produced by the galvanic current but these contractions occur only at the opening and closing of the circuit.

The most active excitant of the movements of the stomach are the products of gastric digestion. Peptones, hydrochloric acid in solution, 1 to 5 parts in 1000, excite no movements of the fundus of the stomach while exciting the movements of the pylorus. Sometimes anti-peristaltic movements are set up by extreme acidity, which explains the eructation of acids.

According to Battelli, strychnia is entirely without effect upon the motility of the stomach. In view of this fact, it is surprising that this drug should be so extensively used as a gastric stimulant, since it exercises a most unfavorable influence upon secretion while rendering no service.

An ice bag placed at the epigastrium causes gastric contractions. Lavage is also an excellent means of stimulating gastric contractions, in cases of gastric inactivity. Insufficiency of the cardiac orifice gives rise to regurgitation of foodstuffs and merycism. Pyloric insufficiency allows a reflux of bile into the stomach. Vomiting of bile only takes place when the reflux is intermittent. Continuous insufficiency of the pylorus gives rise to diarrhea very soon after eating.

Pain in the Stomach

Q. **What is the best method of securing relief from acute pain in the stomach?**

A. Apply hot fomentations over the seat of pain. A large drink of hot water will frequently stop the pain at once. Cramp in the stomach may usually be relieved in the same way. Pain in the stomach may often be relieved by a general hot bath when other measures fail. The temperature of the water should be increased after the patient enters the bath, as hot as can be borne, say 110° or 112° F.

In many cases it is well to drink a couple of glasses of hot water. The temperature of the water should be as hot as can be swallowed without inconvenience.

Regurgitation of Food

Q. **What causes the regurgitation of food?**

A. Regurgitation of food is in most cases probably due to permanent or temporary obstruction of the outlet of the stomach. The

pylorus may be permanently obstructed by cancer or other growth, or it may be temporarily obstructed by contraction. The last named condition is the most frequent cause of regurgitation.

When the outlet of the stomach is obstructed by some organic change, such as ulcer, cancer or compression by bands due to inflammation, relief may be obtained by operation. Spasm of the pylorus is most frequently produced by hyperacidity, which may generally be relieved by regulation of the diet. The foods should be soft, not in a liquid state; that is, in the form of purées. The food should be swallowed after slight mastication only, and one or two tablespoonfuls of olive oil should be taken at each meal. Care should be taken to have the bowels move three or four times a day.

The bile and pancreatic juice, alkaline fluids, normally regurgitate into the stomach and neutralize the gastric acid, reducing the acidity from five parts to three parts of hydrochloric acid in one thousand parts of gastric juice.

Bitters Do Not Aid Digestion

Q. **Do bitters assist in the digestion of food?**

A. Recent laboratory experiments show that the time-honored faith in bitters as an aid to digestion is wholly without scientific foundation. Moorehead demonstrated by experiments upon animals that bitters do not increase a secretion of gastric juice, and Carlson has demon-

strated the same on both human subjects and dogs. The administration of bitters did not increase either the amount of pepsin in the gastric juice or the amount of gastric acid. It is evident that all benefit supposed to be derived from bitters must be attributed to their bad taste, that is, to their psychic effects.

How Chewing Aids Digestion

Q. **What is the effect of chewing upon gastric secretion?**

A. "Chewing tasteless or inert substances produced little effect on the gastric secretion, but the chewing of palatable and highly flavored foods produces a decided increase in the rate of the gastric secretion. Seeing, smelling or thinking of food produced only a slight effect upon the rate of secretion. The secretion of gastric juice usually begins very soon after food is taken into the mouth."

Experiments made by Hawk of Philadelphia and others show that the secretion of appetite juice, that is, the secretion set up by the chewing of the food, lasts for an hour or for an hour and a half or even longer, providing the chewing is continued.

The Ten Gates

Q. **Does the food move continuously through the alimentary canal?**

A. No. The movement of the food along the alimentary tube is not at a regular rate. Numerous pauses occur.

The pauses essential for these special

processes are secured by means of what may be called "gates," by which the progress of each morsel of food is temporarily checked while some special work, as of digestion, absorption, or selection, is being accomplished.

The gates are ten in number. Their location and relation will be readily understood after a glance at the accompanying diagram. The names of the several gates are as follows:

1. Entrance or Food Dictator's gate, the mouth.
2. Food Inspector's gate, the soft palate.
3. Food and Water gate.
4. Stomach gate.
5. The Bowel gate, Pylorus.
6. Control gate, ileocecal sphincter.
7. Colon gate, ileocecal valve.
8. Reversing gate, middle of transverse colon.
9. Discharging or ejector gate, pelvic colon.
10. Exit gate, anus.

The Housebroken Colon

Q. **Why is constipation universal?**

A. Because civilized people are house-broken.

Civilization is a process of taming and is often so overdone as to become destructive.

No other animal, except the house-dog, suffers from constipation as does man; and the dog suffers from colon troubles for the same reason the man does, namely, because he is "house-broken."

The wild man and the wild dog, as well as man's nearest relatives, the big apes, of the

African jungles, know nothing of the miseries of constipation, colon stasis, or constipation, a product of civilization. It is the result of perverted habits, neglect, and pernicious training and education.

The civilized colon is a poor, crippled, maimed, misshapen, overstretched in parts, contracted in other parts, prolapsed, adherent, "kinked," infected, paralyzed, inefficient, incompetent. It is the worst abused and the most variously damaged of any organ of the body.

Before the advent of the X-ray, no one had more than a suspicion of the sad condition of the poor colon. It was known to be generally inefficient, but this was charged to inertia, a sort of constitutional laziness rather than to definite disease or structural damage.

But the X-ray, that marvelous revealer of secrets, has given us a look inside and has revealed a state of depravity in the colon never dreamed of. In the light of modern X-ray revelations, the colon appears to have more different and serious things the matter with it than any other bodily organ.

The house dog is necessarily trained to avoid evacuating his bowels in the house. In other words, he is taught to restrain his bowels from moving when they are so disposed, until it is convenient for his owner to turn him out of doors. A dog so trained is house-broken.

If dogs were the only house-broken creatures, what a world of wretchedness, suffering, even crime and human wreckage would be saved.

All civilized people are house-broken, and

like poor house-broken dogs, pay for this sinister education an infinite price, not only in misery and inefficiency, but in deadly disease and shortened life.

The whole civilized portion of the human race is house-broken. The mother or nurse of every infant begins the work of training the child to control its bowels, which means to thwart the automatic process by which the wastes are normally dismissed from the body, and by the time the child is two years old it is well house-broken and hence constipated. In this respect the infant house dog learns faster than the human infant.

A house-broken colon is a damaged colon. The automatic process of discarding the body wastes demands a prompt response to the "call" for evacuation. As soon as the pelvic colon, the discharging gate, is filled and lifted ready for action, a desire for evacuation is experienced. When the fecal matters begin to pass into the rectum the desire becomes so pronounced that it must be firmly resisted to avoid immediate evacuation. After a time the desire disappears, but the fecal wastes remain in the rectum. The "call" is now lost. It may return later when the rectum is still more distended by the advance into it from the pelvic colon of additional waste matters. This "call" may be resisted also, and so the rectum may become distended to the extreme limit and will no longer give notice of the entrance of the feces even when it has been artificially emptied. In other words, the "call" is permanently lost, the rectum is paralyzed.

Thousands of sufferers from constipation never have a desire for evacuation except when a laxative drug has been taken.

When the call is lost, no warning is given of the condition of the colon and accumulation of waste matters may occur to an astonishing extent. Once or twice a week, perhaps, a dose of salts or of some other cathartic is taken for a sort of house-cleaning and the rest of the time, filthy, putrefying wastes fill and distend the colon and cause injuries which in many instances can never be repaired.

Semi-civilized people and savages have a keen appreciation of the importance of prompt attention to the automatic demands of the body. A medical missionary who had spent many years in Arabia told the writer that the common objection offered by the tribal Arab to living in Aden was the necessity for looking up a suitable place for evacuation in compliance with the law.

A new and sensitive colon conscience must be developed among civilized people if the world is to be saved from the soul- and body- and even race-destroying effects of universal constipation and world wide autointoxication.

The universally prevalent idea that one bowel movement daily is sufficient is proof of the universal prevalence of constipation. One bowel movement means constipation of a pronounced degree. X-ray examination after an opaque meal shows that persons whose bowels move once a day are constantly carrying in their colons the putrefying residues of five to ten meals or even a larger number. The colon

is never empty even after a movement, and toxemia is present and often shown in the coated tongue, foul breath, headache, depression, and other indications.

One bowel movement a day is very marked constipation.

Prehistoric Man a Fruit-Eater

Q. **What was the diet of prehistoric man?**

A. In his entertaining work, "Prehistoric Man," Elliott tells us that in the earliest period when man's progenitors were beginning their career there were no carnivorous animals, and when the anthropoid apes, man's nearest relative, first made their appearance nut trees of various sorts were found in abundance. Figs, prunes, palms and pine nuts as well as hazelnuts grew in great profusion. Says that learned author. (Prehistoric Man, pages 22 and 23):

"On the bushes by the rivers and along the shore there were all sorts of fruits and nuts. For the subsistance of our lemur-monkey-man in the early stages of evolution, what fruits would seem *a priori* most suitable? I think one would select the banana and bread fruit. Ancestral forms of both were flourishing in the Eocene. Many other fruits with which man has been afterwards continually (perhaps one might venture to say *most intimately*) associated occur at this period. These are, most of them, found in so many places that one is apt to think they were then of world-wide distribution.

"In the temperate brushwood and on river-

sides, acorns, hazel-nuts, hawthorn, sloe, cherry and plum might be found. Here and there he might alight upon a walnut or almond; figs also of one kind or another seem to have been common. Palm trees existed, and some of them were of enormous size.

"If the idea of climatic and other conditions which we have tried to express is at all correct, there ought to have been many bulbs; but these would seldom be preserved as fossils, for they would grow in drier land away from the river bank. There is nothing to show whether the honey-ant, termites, and the honey-bee existed in the Eocene. With honey, in addition to the other items given above, the lemur-monkey-man could have found every article of diet which is of importance to the lowest races of mankind. A Yahgan, Bushman or Vedda would consider a land like this a paradise. Moreover, there was not, so far as we are aware, any carnivorous creature in the Eocene period, or one which might have been a serious enemy."

The Natural Diet of Man

Q. **What is the natural diet of man?**

A. Fruits, soft grains, nuts, tender shoots and juicy roots.

Sir Richard Owen, in his "Odontography," wrote: "The apes and monkeys, which man most nearly resembles in his dentition, derive their staple foods from fruits, grains, the kernel of nuts, and other forms in which the most sapid and nutritious tissues of the vegetable kingdom are elaborated; and the close resem-

blance between the quadrumanous and human dentition shows that man was, from the beginning, more especiallly adapted to eat the fruit of the trees of the garden. This is the conclusion to which my friend Mr. Bell (afterwards Sir Charles Bell, F. R. S.) has arrived in his physiological observations in 'The Natural Food of Man' (1829, p. 33)."

Sir Charles Bell, F. R. S., wrote, "It is, I think, not going too far to say that every fact connected with the human organization goes to prove that man was originally formed a frugivorous animal. This opinion is principally derived from the formation of his teeth and digestive organs, as well as from the character of his skin and the general structure of his limbs."—*"The Natural Food of Man," p. 33."*

Gassendi, who was born in 1592 and was a professor of philosophy, a student of anatomy and physiology, insisted that, from physiological reasons, especially the structure of the teeth, man was destined for a food, not of flesh, but of fruits.—*Gassendi's letters to Van Helmont.*

The great botanist Ray declared that whatsoever food is necessary to sustain us, whatsoever contributes to delight and refresh us, is supplied and brought forth by plants. "Certainly man was never made to be a carnivorous creature."—*Evelyn's Acetaria, p. 170.*

According to Prof. John Smith, an English physiologist and comparative anatomist, "The present constitution of man, like the original, is best fitted for a diet derived directly from the vegetable kingdom. Keen scent, strong talons,

a simple stomach, a short alimentary canal, sharp angular teeth, and a cunning disposition generally mark the carnivorous animal. The canine teeth are long, conical, acute, and strong; there is not the slightest resemblance between these cuspids and the so-called 'canine' teeth of man. In the horse, camel, and stag they are pointed and large, much larger than in man; yet it is not contended, as in the case of man, that these beasts should be carnivorous to act up to their dental outfit. The cheek-teeth in the lower jaw of man are like those of herbivorous and frugivorous animals, simply raised into rounded elevations and directly opposed to the upper teeth. In the carnivora these lower teeth are shut within the upper, so as to tear and cut flesh. The lateral motion of the jaws in man is like that of the frugivora, and quite unlike the motion up and down in the carnivora. The secretion from the salivary glands, especially in vegetarian races, is in man like that of the herbivora, though the glands are smaller. The stomach is something between that of most carnivora and most herbivora. Again, in the immense number of perspiratory glands of the skin, man differs from carnivora.

"Vegetable diet is as little connected with weakness and cowardice as that of animal matter is with physical force and courage.

"That men can be perfectly nourished, and their bodily and mental capabilities be fully developed in any climate by a diet purely vegetable, admits of abundant proof from experience.

"The teeth of man have not the slightest re-

semblance to those of the carnivorous animals, except that their enamel is confined to the external surface. He possesses, indeed, teeth called canine, but they do not exceed the level of the others, and are obviously unsuited to the purposes which the corresponding teeth execute in carnivorous animals.

"The teeth and jaws of men are in all respects much more similar to those of monkeys than of any other animals.

"A skull of the orang-utang has the first set of teeth; the number is the same as in man, and the form so closely similar that they might easily be mistaken for human.

"Man possesses a tolerably large cæcum, and a cellular colon, which, I believe, are not found in any carnivorous animal."

"At present (December, 1818) his diet (the orang's) is vegetable, both from his own choice and because it agrees much best with him.—*Prof. Wm. Lawrence, F. R. S., of the Royal College of Surgeons.*

Mr. Thompson, in his "Study of Animal Life," quoting Richard Owen's assertion of the "all-pervading similitude of structure" between man and the highest apes, says that subsequent research has continued to add corroborating details. Man and gorilla differ less than gorilla and marmoset. The bodily life of man is like that of monkeys; both are subject to the same diseases; . . . there are about seventy vestigal structures."

Charles Darwin stated that in ancient times man probably subsisted upon fruit. He has

also given an account of his conviction of the close relation, physiologically, of the human body to that of the higher simiae. "I do not put my trust in any single character, even that of dentition, but I put the greatest faith in resemblances in many parts of the whole organization."—*"Descent of Man" and Darwin's Letters.*

Mr. Grant Allen says: "Primitive pastoral races keep their domestic animals mainly for the sake of milk, or as beasts of burden, or for the wool and hair; they seldom kill one except for a feast at which the gods are fellow-partakers. It is probable," he adds, "that the habit of flesh-eating has arisen out of the substitution of a divine animal victim for the divine human victim of earlier usage. Hence our butchers' shops."

Sir Henry Thompson, the great surgeon, wrote: "Few children like that part of the meal which consists of (flesh) meat. . . . Many children manifest great repugnance to meat at first. . . . I am satisfied that if the children followed their own instinct in that matter, the result would be a gain in more ways than one."—*Diet in Relation to Age and Activity.*

Rousseau said that one proof that the taste of meat is not natural to the human palate is the indifference which children have for that kind of food, and the preference they give to vegetable aliments. "It is of the utmost consequence not to vitiate this primitive taste in children."

Almost any animal can be made to eat flesh.

The kangaroo has canine teeth. Horses, oxen, and sheep may be taught to eat flesh. Norwegian cows have been known to eat flesh greedily. Goldsmith saw a sheep eat flesh.

The monkey and even the higher apes can be easily trained to eat cooked meat but will not eat raw meat. However, the experience of keepers of wild animals have convinced them that meat is not a wholesome food for primates, that is, monkeys and apes. The keeper of the apes and monkeys in the London Zoo told the writer that he never gave meat in any form to either the small monkeys or the large ones.

Dr. R. S. Tracy writes: "Children are notoriously fond of raw things. . . . There is only one article of daily use that the boy will not voluntarily eat raw, and that is meat—the flesh of a dead animal. . . . .

Plutarch wrote: "That it is not natural to mankind to feed on flesh, we first of all demonstrate from the very shape and figure of the body; for a human body in no way resembles those born for rapine, . . . but if you will contend that you yourself were born to an inclination to such food as now you have a mind to eat, do you yourself then kill what you would eat, but do it your own self, without the help of cleaver, mallet, or axe, as wolves, bears, and lions do."

It is a curious fact, physiologically considered, that lions and tigers seem to be capable of living fairly well with only a little flesh food, and with a large quota of vegetables. Some of the fakirs of India give their tame tigers no raw animal food, and only supply them with a mixture of boiled rice and vegetables, their own

diet. They allow these tigers sometimes to roam at large.

The strongest, most muscular animal for its size is probably the monkey, in such tribes as the orang-utang, the gorilla, and the macaque, one of which is said to have been always the winner against dogs twice his size. They are probably the most formidable fighters in the animal world. The orang-utang, according to Dr. Alfred R. Wallace, is a harmless creature, feeding on fruit, and never attacking any other animal except in self-defense. It is very large and strong, and has enormously powerful arms. As to the gorilla, Du Chaillu, the great traveler and the discoverer of this huge ape, saw one break to pieces quite easily a gun accidentally dropped; and Dr. Duncan affirms that the gorilla is more than a match for the African lion. It is said that ten men are not too many for holding a full-grown specimen.

All these monkeys are practically vegetable feeders, living on fruits, nuts, and roots, but some kinds occasionally eat insects, birds, and eggs. For purposes of comparison with men, the orang-utang and gorilla are the most useful examples on account of the close resemblance of the teeth, internal organs, and constitution generally, to the human. Apes have been often fed, when in confinement, on animal flesh, but have not thriven upon it, and the keepers have been compelled to restore them to a vegetable diet.

The Brook Farm Experiment

Q. **What was the Brook Farm Experiment?**

A. The early part of the last century was particularly prolific in experiments of this kind. A notable, though unsuccessful, example was the "Brook Farm Experiment." Simple, unsophisticated living was the essential aim of the group of intellectuals who gathered at Brook Farm, Massachusetts, in 1842, under the leadership of Reverend George Ripley. Wendell Phillips, Horace Greeley, Charles Dana, Hawthorne, Margaret Fuller, Bronson Alcott, Emerson, Thoreau. And more than a hundred others of the philosophers of New England sympathized deeply with this movement, and many became members of the community, and sought to find a practical solution of the problem of normal living under the conditions of life imposed by civilization.

A similar experiment on a smaller scale was made by Thoreau, who sought to discover the essentials of the simple life by living for two years in a cottage built by himself on the banks of Walden Pond, near Concord. His house cost him twenty-eight dollars, besides his own labor. He found that he was able to provide himself with all the necessaries of life by working two hours a day, the average cost for food being twenty cents a day.

As regards the results of his unique experiment, Thoreau says:

"I learned from my two years experience that it would cost incredibly little trouble to obtain one's necessary food even in this latitude; that a

man may use as simple a diet as the animals, and yet retain health and strength. I have made a very satisfactory dinner simply off a dish of purslane, which I gathered in my corn-field, boiled and salted. . . . And pray what more can a reasonable man desire, in peaceful times, in ordinary noons, than a sufficient number of ears of green sweet-corn boiled, with the addition of salt.

"As for salt, that grossest of groceries, to obtain this might be a fit occasion for a visit to the seashore, or, if I did without it, altogether, I should probably drink the less water. I do not learn that the Indians ever troubled themselves to go after it."

While living in his cottage, Thoreau adopted a very meager bill of fare, rejecting not only tea, coffee, and flesh meats, but also butter and milk. By his active out-of-door life he developed so athletic a physical state that he could "outrun, outrow, and outwalk any of his townsmen." He, in fact, developed such unusual power of mind and body that he attracted to his humble abode in the wilderness such eminent persons as Agassiz, Channing, and Lowell, as well as multitudes of less distinguished visitors. Indeed, it is probable that his experiment was terminated by his increasing popularity, which furnished Hawthorne a text for a homily about "the beauties of conspicuous solitude."

The ideals of the simple life are certainly not new. In every age there have been at least a few who have appreciated the value of plain living and high thinking. Such a man was

Cyrus, the Persian. Confucius, Zoroaster, and all the Eastern sages were advocates of the simple life. The same may be said also of the founders of all the great religions that have controlled the minds of great masses of human beings in all the ages from Moses down to Mahomet.

"The Simple Life"

Q. **What is "the simple life"?**

A. The real simple life is practical and comprehensible. It is not merely a psychological phantasy, a state of mind, of psychic or physical beatitude. It is the laying hold of the great fundamental principles of life, that reach back to the very beginnings of the race.

The simple life is not an innovation, a modern discovery or invention. It is the old-fashioned life, the real life, the life of primitive times; a return to the "old paths" from which the perversions of our modern civilization have gradually diverted the millions of civilized men and women,—perversions that are responsible for the multitudinous maladies and degeneracies which yearly multiply in number and gravity.

Through thousands of years the race has been getting farther and farther away from that beautiful, normal simple life that our remote ancestors led in "the Golden Age" of which the old Greek and Roman poets sang. The greatest problem before the world at the present time is how to get back to the simple life, the "golden," the normal life.

The most ancient records tell us that the first men lived not in a house, but in a garden—the beautiful out-of-doors. Our natural instincts teach us that the house is not our natural habitat. How the great stirring life out of doors attracts and fascinates us! The power in the grass that carpets the earth in early spring; the mysterious energy that bursts the buds and spreads out the green leaves and paints the gaily tinted blossoms; the forces in the wind, the waterfall, the waves, the miracle-working sunshine,—how all these and the countless objects and activities of the natural world about us inspire and animate us and bring us face to face with the infinite and beneficent power that made us and that established an order of life for every creature, and that is always calling us through deep-seated, often ignored and forgotten but still unquenchable instinct voices, back to the normal life.

Biologic Living

Q. **What is biologic living?**

A. The great biologic laws, under the control of which man has been developed during countless ages, are as immutable and as unescapable as the force of gravitation. The principles which rule our physical being are the most fundamental elements of human life. Most human maladies and miseries are the natural result of our failure to recognize this profound truth. Hunger, thirst, desire for air, sunlight, and other bodily appetites are primitive instincts which, if followed implicitly and ra-

tionally, would result in the highest degree of physical vigor and efficiency.

But we pervert every instinct.

We affect habits that are wholly foreign to our biologic requirements and adaptions. Instinct calls us to live in the open. We imprison ourselves in offices, factories, and air-tight bedrooms. The result is the great white plague, tuberculosis.

Instinct calls for water to cool and cleanse the vital machinery. We guzzle beer, wine, whiskey, tea, coffee and other intoxicants, and suffer countless miseries in consequence.

Instinct and biologic law teach us to select a bill of fare identical with that of our cousins, the anthropoids—the chimpanzee, the orang and the gorilla, who with man form the family of primates, one of the most ancient and most remarkable of all animal races. But instead of contenting ourselves with the natural products of the earth—fruits, nuts, soft grains and tender shoots—we have unlawfully and unbiologically invaded the food stores of nearly every other species of animal. We eat fish with the cormorant; wild game with the lion and the eagle; we gnaw bones with the dog and nibble cheese with the larvæ of flies and other insects. We gulp down oysters and clams with the sea gull and the pelican and we eat putrescent meats (prime beef) with the carrion crow and the buzzard, and the result is universal dyspepsia. The human digestive machine cannot deal with such a miscellaneous assortment of foodstuffs. No single stomach can properly digest the bill of fare of all creation.

.Our fundamental adaptations and nutritive needs we cannot change. We must bow to the Omnipotent Forces which made us as we are, and conform our lives to the cosmic order. We must keep step with the music of the spheres to which the old Greek philosophers listened; we must keep ourselves "in tune with the infinite." This is the key to the normal, healthy life.

Fletcherism

Q. **What is fletcherism?**

A. Fletcherism is practically synonymous with thorough mastication. Mr. Horace Fletcher by experiments upon himself and others demonstrated the importance of thorough mastication of food. Mr.Fletcher proved that thorough chewing secured at least the following advantages:

1. A better appreciation of the food, that is, increased gustatory pleasure.
2. More thorough digestion of the food.
3. A very great economy in the amount of food required, it being found that the intake of food might be reduced one-third or even one-half without loss of weight and with actual gain in physical comfort, efficiency and endurance.
4. It was especially noted by Mr. Fletcher that a great reduction might be made in the the amount of protein required to satisfy the demand of the appetite and the needs of the body.

Mr. Fletcher's experience and that of many of his disciples showed that thorough mastication reduced the need for protein to such an extent that flesh meats of all kinds might be easily and advantageously eliminated.

5. Mr. Fletcher also noted that the applica-

tion of his principle to alcoholic beverages by slow sipping and long retention of the liquid in the mouth very soon eliminated the desire for these beverages. The appetite for tobacco also in time disappeared.

Of course, Mr. Fletcher did not discover chewing. Many old writers, especially Brillat Savarin, strongly insisted upon the importance of thorough mastication of the food. For more than forty years, the author has preached the gospel of thorough mastication. The purpose to encourage the eating of dry foods and thorough mastication of the foods, led to the invention of cereal flakes now the most popular of breakfast foods but usually eaten moist instead of dry, as intended by the inventor.

Q. **Is Fletcherism a scientific doctrine?**

A. The term "fletcherism" has been applied to the teaching of Mr. Horace Fletcher, the most important features of which were (1), that the food should be held in the mouth and chewed until all the flavor had been extracted from it, and (2) that only that portion should be swallowed which could be reduced to a semi-liquid condition in the mouth, the coarse portions remaining being rejected as unfit to enter the stomach.

Mr. Fletcher, having been broken down by high living and neglect of hygiene, conceived the idea of improving his health by careful attention to thorough mastication of his food. He devoted himself assiduously to the thorough chewing of his food and with such remarkable results that he set forth to organize a chewing

reform, and pushed this propaganda with so much ability and enthusiasm that he created wide-spread interest and was called upon to lecture before Chautauquas and other assemblies in various parts of the United States. His pleasing personality, as well as the evidence of physical regeneration which he presented in himself, won friends for him and his cause wherever he went. Even the most eminent professors of physiology and other scientists became interested in his ideas and were induced to undertake laboratory experiments to test some of his claims and the inferences which he drew from his observations, especially with reference to the low-protein ration.

The mere mechanical treatment of food in the mouth was a small part, only, of Mr. Fletcher's discovery. He found that when he chewed each morsel thoroughly, he ate much less food than formerly, and was, notwithstanding, much better satisfied in a gustatory sense, and much better nourished. He soon found, also, that when the food was well chewed, a faculty of discrimination appeared which had not before been active. In fact, he made the remarkable and important discovery that every man possesses in his nerves of taste a food administrator which is capable of instructing him in relation to the quality of his food as well as in regard to its quantity. Indeed, he found that the ability of this discriminating sense is such that when fully active and well developed, it becomes a complete regulator of nutrition, telling one not only how much to eat and when to eat, but how much of

each particular element of the food. Mr. Fletcher was the first, so far as the writer knows, to note this interesting function of the palate, and it was unquestionably his greatest discovery. The reality of the existence of such a discriminating function has since been thoroughly demonstrated in experiments in the feeding of rats by Osborne and Mendel and the feeding of pigs and other animals by others.

Mr. Fletcher was right in his estimate of the value of thorough mastication of the food, though he was wrong in supposing much chewing to be a rule of universal application. In case of hyperacidity, in which the stomach makes an excess of gastric acid, the food should be chewed as little as possible, since more chewing makes more acid. But, of course, the food must be prepared in the form of purée, so that chewing is not needed for mechanical preparation.

Mr. Fletcher somehow hit upon the idea that it was essential that all the food should be made liquid *in the mouth,* and that any part of the food which could not be reduced to liquid form *in the mouth* should be discarded. This idea was not included in his discoveries about the discriminating power of the gustatory nerves, and was not a legitimate inference from the demonstrated value of thorough chewing; it was a pure supposition or hypothesis, or perhaps we should say mere conjecture. But Mr. Fletcher attached to this assumption all the importance of a demonstrated truth, and dwelt much upon it. This most unfortunate error

was his undoing. It led him to avoid foodstuffs which contained much cellulose or which required much chewing and to restrict his dietary to soft foods, soups, purées, and liquid foods.

One result of the use of soft foods which required little chewing was rapid decay of his teeth. On his various visits to Battle Creek, he was constantly in the hands of the dentist, who told the writer more than once that he was astonished at the bad condition in which he found Mr. Fletcher's teeth, and at the rapidity with which they were undergoing decay.

But another and still more serious result of the soft diet, wholly free from indigestible elements, was a most obstinate constipation. Mr. Fletcher told me on several occasions that his bowels moved only once or twice a week.

After a time Mr. Fletcher came to look upon this chronic constipation as a great advantage, and as a proof of the virtue of extra mastication. He argued that thorough chewing secured such perfect digestion and such complete absorption and utilization of the food that there was left no residue for germs to act upon, and so was a sort of sterilizing process. As proof of his, he offered the fact that the small hard stools which he dismissed from his colon at intervals of several days were almost odorless.

Mr. Fletcher at last saw his error and endeavored to correct it. But, unfortunately, it was too late. His vital stamina and resistance to disease had been exhausted by many years' struggle against colon poisons.

The Simple Life Not an Experiment

Q. **Is not the simple life more or less an experiment?**

A. No. The principles of the simple life are well grounded in human experience. Hundreds of examples might be cited of men who have prolonged their lives and useful activity far beyond the usual age at which men become senile and incapable, by temperate and simple living.

A striking example of the influence of a return to the primitive mode of life which must have been led by the prehistoric ancestors of the present human race, is afforded by the example of Alexander Selkirk, the original of DeFoe's Robinson Crusoe.

Selkirk, a sailor, was put ashore on the uninhabited island of Juan Fernandez by his captain, with whom he had quarreled, and for four years lived in solitude, subsisting upon the natural resources of the island, his whole stock of food when put ashort having consisted of food sufficient for two meals. At first he was much depressed by the lack of human companionship; but after a year or two he came really to enjoy his simple life. The genial climate, the simple out-of-door activities necessary to supply his daily needs and especially an extraordinary sense of well-being and the "joy of living," made him quite content with his lot, so that when he was finally accidentally discovered by a ship compelled to land for supplies, he was really more concerned with the effort to assist in relieving the sailors' needs than elated

at the prospect of leaving his island home. During the four years of natural, simple living, his vigor, agility, and endurance had increased to such a degree that he could outrun and capture the swiftest wild goats speeding up the steep mountain sides. Says his biographer, who interviewed him in 1711 soon after his return to England, respecting the effects of the simple life he was compelled to lead:

"This manner of life became so exquisitely pleasant that he never had a moment heavy upon his hands; his Nights were untroubled, and his Days joyous, from the Practice of Temperance and Exercise. . . .

. . . "The Man frequently bewailed his return to the World, which could not, he said with all its enjoyments, restore to him the tranquility of his Solitude. This plain Man's Story is a memorable Example that he is happiest who confines his wants to natural necessities; and he that goes further in his Desires, increases his Wants in proportion to his Acquisitions; or to use his own Expression, 'I am now worth eight hundred Pounds, but shall never be so happy as when I was not worth a Farthing.'"

An Indian's Opinion of College Training

Q. **Does civilization make men?**

A. Benjamin Franklin once told the following story which presents the red man's views of college training:

"After the principal business was settled, the commissioners from Virginia acquainted the Indians by a speech that there was at Williams-

burg a college with a fund for educating Indian youth; and that, if the Six Nations would send down half a dozen of their young lads to that college, the government would take care that they should be well provided for, and instructed in all the learning of the white people. . . . 'We are convinced,' the Indians replied, 'that you mean to do us good by your proposal, and we thank you heartily. But you, who are wise, must know that different nations have different conceptions of things; and you will therefore not take it amiss, if our ideas of this kind of education happen not to be the same with yours. We have had some experience of it; several of our young pople were formerly brought up at the college of the northern provinces; they were instructed in all your sciences; but when they came back to us they were bad runners, ignorant of every means of living in the woods, unable to bear cold or hunger, knew neither how to build a cabin, take a deer, nor kill an enemy, spoke our language imperfectly; were therefore neither fit for hunters, warriors nor councellors;—they were totally good for nothing. We are, however, not the less obliged by your kind offer, though we decline accepting it; and, to show our grateful sense of it, if the gentlemen of Virginia will send us a dozen of their sons, we will take great care of their education, instruct them in all we know, and make men of them.'"

The Chittenden Standard

Q. **What is the so-called Chittenden standard?**

A. Prof. Chittenden proved by experiment that a dietary containing ten per cent protein is capable of sustaining the body in health and vigor. A dietary so arranged that the protein constitutes ten per cent of the total number of calories is said to be based upon Chittenden's standard.

Experience has shown that there are, indeed, many advantages in the elimination of an excess of protein. It is not, however, consistent to call a standard which provides protein to the extent of ten per cent of the total ration a "low-protein standard." As pointed out by Rubner some years ago, Nature provides the nursing infant with a ration which contains but seven per cent of protein, notwithstanding the fact that forty per cent of the ingested protein is required for tissue building, leaving less than four and one-half per cent for tissue repair, or less than six-tenths of one calory per pound of body weight.

The Chittenden standard provides more than double this amount, and so should be called a high-protein rather than a low-protein standard. In these days, when the world's supply of protein is barely sufficient to meet actual needs, the question of essential protein requirement is one of great practical importance from an economical as well as a hygienic standpoint.

It is on this account not a little reassuring to find in the report of the Inter-Allied Food

Commission which recently met in London, and established the minimal ration for each of the essential foodstuffs, the following statement: "It is not desirable to fix a minimal meat ration, in view of the fact that no absolute physiologic need exists for meat, since the proteins of meat can be replaced by proteins of animal origin, such as those contained in milk, cheese and eggs, as well as by proteins of vegetable origin."

The mischiefs arising from indulgence in foodstuffs too rich in protein, an increasingly prevalent practice in English-speaking countries within the last fifty years, have received less attention than they deserve, even from writers who have recognized the disadvantages of high-protein feeding.

The chief injury resulting from an excess of protein is not in the extra work required of the kidneys in the elimination of surplus urea, a task which the renal organs can accomplish with comparative ease, but the general poisoning of the body resulting from putrefaction in the colon of the undigested and unabsorbed protein remnants. It is the presence of these putrefaction products, consisting of ptomaines and other poisonous substances, which gives to the feces of a carnivorous animal their characteristic offensiveness as compared with the droppings of a horse, a sheep or any other non-flesh-eating animal. The same difference exists between the stools of a flesh-eating human being and a non-flesh-eating man.

Protein Ration

Q. **Why is the so-called high protein ration injurious?**

A. One of the greatest of all dietetic errors is the excessive use of protein. In this class are included meats of all sorts, and eggs. The experiments of Chittenden and others have shown that the chief and only necessary function of protein in the body is the repair of tissues, and for this purpose a very much smaller amount is required than has formerly been supposed. Chittenden has, in fact, by his experiments, reduced the protein standard to one-half or one-third the amount regarded as necessary by Voit, Pettenkoffer and other older authorities. The excessive use of protein is regarded by Chittenden, and many others who have given this subject careful study, as chiefly responsible for the various disorders and degeneracies which have heretofore been ascribed to uric acid.

When taken in quantities beyond the needs of the body, proteins encourage, to an enormous extent, the intestinal putrefactions which Combe, Metchnikoff and others have shown to lie at the foundation of a large proportion of the chronic disorders, both functional and organic, to which human beings are subject.

Chittenden's standard reduces the requirement of protein to so low a point that the use of flesh foods becomes practically impossible within physiologic limits. Even the potato contains a sufficient amount of protein to meet the body needs. Bread contains quite an excess, while milk supplies a very much larger proportion of

protein than is required by adult human beings. Nuts and legumes are so rich in protein that care must be exercised in their use to avoid excess. Hence it is practically impossible to add meat to the ordinary bill of fare without getting an excess of protein and incurring the risk of resulting intestinal autointoxication.

Rubner has shown that a nursing infant is supplied with about one calory of protein per pound of body weight. This fact is highly important since it is a criterion by which we may determine the actual amount of protein required by the body of an adult as well as that of an infant. Other experiments have shown that an infant stores up in its blood and muscles about 40 per cent of its total intake of protein. The retained protein is used to support the growth of the body. This fact shows that 60 per cent is sufficient to supply the material necessary for repair. In other words, a little more than one-half of one calory per pound of body weight is all that the tissues actually require.

Consequently, a dietary which supplies one calory per pound of complete protein is really not a low protein diet, but is, in fact, a high protein diet. The diet of a person weighing 150 pounds should furnish 150 calories of protein, which will be found in one and one-half ounces of dry protein. It must be remembered, however, that these figures are based upon complete protein. To make certain of getting the necessary supply of complete proteins the ordinary vegetable diet of an adult should be supplemented by a pint of milk or its equivalent.

For this purpose skimmed milk answers the purpose as well as full milk. Three or four ounces of cottage cheese would furnish the equivalent of a pint of milk.

Diet and Development

Q. **Is there anything positively known concerning the influence of diet upon development?**

A. Dr. Harry Campbell, of England, has published an account of experiments upon wild rats, in which he found that animals fed on milk and bread soaked in milk approximate most nearly to the type of structure found in wild rats. From his observations, Campbell feels justified in stating the following:

1. The use of non-physiological diet—for example, exclusive flesh, rice, or porridge—induces in the great majority of cases a modification in the structure of the uterine mucous membrane. This modification consists in a diminution in the number of the large connective tissue type of cells which appear to be important constituents in a physiologically active mucous membrane..

2. The structural change is most profound in animals fed from weaning on an exclusive ox-flesh diet. In such animals the development of the uterus is also most interfered with.

3. The structural change in 2 is associated with sterility.

"Chalmers Watson, to whom I am indebted for much of the material used in this investigation, pointed out that a meat diet, if begun at

weaning, almost invariably led to sterility. The present investigation shows that the sterility is probably due to the structural and developmental abnormalities in the uterus induced by the normal diet. It has been shown that the consumption of meat per head in England is today almost seventeen times as great as it was in 1850. During the same period the fall in the birth rate has been most marked."

Hospital Diet Reform

Q. **Is there not need of a reform of the ordinary hospital diet?**

A. That there is, indeed, a growing need of such a reform the writer has contended for many years, and quite recently Major Hoskins, an eminent surgeon, called attention to the fact that hospital dietaries needed to be more carefully individualized; that is, adapted to the needs of individual cases, instead of giving nearly all cases the regulation "regular diet" or "light diet," or "convalescent diet."

The major lays special stress upon the need of reforming the general character of the diet with special reference to combating the almost universal constipation which afflicts hospital patients. He says: "For that class of patients who are troubled with constipation when not actively exercising, a diet including especially laxative components should be provided. Rather than establishing a special laxative diet for this type of patients, however, the situation could be met fairly well by deliberately making the diets of all 'regular' patients laxative. The routine

use of cathartics in a hospital is a reflection on the dietitian.

"Military patients generally want to eat to repletion. They may be allowed to do so if the menus are properly designed. But appetite cannot be relied on for adequate regulation of consumption. Many eat merely for amusement. Feeding a man 3,600 calories, however, when he needs only 1,800 calories, is to waste food inexcusably. The menus should be so planned that food of bulk to fill an ordinary stomach will furnish only the proper number of calories. Stewed and fresh fruits and the coarse vegetables should be utilized freely. The statement that 'the men will not eat turnips, etc.,' merely means that the hospital cooks are incompetent. The coarse vegetables are eaten with relish when properly prepared. In some hospitals the training of cooks is only half done. They should all have a 'post-graduate' course in 'cookery for the sick' to be given by the dietitian, such as the 'diet cooks' usually have had."

Poisons in Animal Tissues—Meat

Q. **Do animal tissues always contain poisons?**

A. The tissues of all animals contain poisonous wastes, the products of the vital activities which are constantly taking place in all living beings. The activities of every tissue result in the formation of special poisons, fatigue poisons and toxic residues which are more or less imperfectly removed from the tissues by the blood during life and carried to the kidneys and other excretory organs to be discharged from the body.

The formation of these poisons is in life so rapid that it is only necessary that their elimination should be suspended for a short time for fatal results to develop. At the death of an animal, as soon as the heart ceases to beat the removal of these toxins from the tissues ceases but the development of toxic matters continues for some-time after, until the final moment of actual tissue death when rigor mortis occurs. It is consequently evident that the amount of these toxins found present in the tissues of a dead animal is much greater than that which is found during life.

The character of these poisons is to a considerable degree well known. Many of them have long been familiar through the examination of the urine, which is properly termed an extract of the tissues.

Substitutes for Meat and Eggs

Q. **When eggs and meat are discarded what vegetable foods should be taken in their place?**

A. As a matter of fact no substitutes for meat and eggs are needed. When freely eaten eggs and meat generally introduce into the diet a surplus of protein which can be dispensed with not only without injury but with very great profit. Ordinary vegetable foodstuffs contain all the protein which the body requires. A diet of peas and beans contains a larger proportion of protein than is required. The same is true of most cereals. Nuts, with the exception of the pecan, are very rich in protein. Pine nuts and almonds contain protein in larger percentage

than does meat itself. As a matter of fact, a pound of pine nuts or almonds contains as much protein as a pound and one-half of the best steak. It is very evident then, that one need have no apprehension of suffering from the lack of protein because meat and eggs are discarded from the dietary. The sense of loss when these articles are discarded may be easily overcome by increasing the amount of butter or olive oil taken at each meal, and if anything more is needed an ounce or two of almonds, or other nuts may be eaten.

Protose, Nuttolene and other vegetable meats are rich in protein.

The newly introduced soy bean is more than a substitute for meat. It is rich in lime and vitamines which meat lacks. Its protein is "complete."

Is Man Carnivorous

Q. **Have human beings a natural appetite for flesh?**

A. Man is a flesh-eater because he has acquired the taste for flesh. Starting out a fruit-and nut-eater, the vicissitudes of terrestrial readjustments and climatic change brought him to the verge of starvation, made him eat flesh and become a cannibal, and reduced him to savagery. Civilization has lifted him up, but the germs of ancestral appetites still linger in him and are easily kindled into activity. In other words, although civilized man wears a garb of culture, if we probe him deep enough we find a savage.

Is Animal Flesh Necessary

Q. **Do scientific authorities admit that animal flesh is not a necessary part of the human dietary?**

A. All modern physiologists admit that flesh food is not an essential part of the dietary of human beings. Von Noorden, one of the most eminent of living physiologists and physicians, in his great work on metabolism says:—

"The old question as to whether the protein of vegetable origin is in respect of value as a food-stuff equal to that of animal origin—whether omnivorous man, like the herbivora, could with impunity draw his entire supply of protein from the vegetable kingdom alone, is in principle one which is already decided for us through the practice of those people who live exclusively on vegetable foods. Physiological investigation can therefore only supply the evidence that it is indeed true that the vegetable-albuminous substances as they occur in nature are equal in nutritive value to an equivalent quantity of protein of animal origin."

Meat Diet Not Necessary

Q. **Is a meatless diet capable of maintaining the body in a state of vigorous health?**

A. Says Doctor Carpenter, an eminent English physician and scientist, "A well-selected vegetable diet is capable of producing the highest physical development."

Doctor Parkes, probably the most eminent of modern writers on hygiene, says, "The well-fed vegetable eater will show, when in training, no inferiority to the meat eater."

The well-known experiments of Lehman show beyond doubt that the use of flesh food requires more work of the kidneys than a vegetable diet. When living on an exclusively animal diet he found that the amount of urea eliminated by the kidneys was two and one-half times as much as when the diet was exclusively vegetable, and one and a half times as much when he partook of both animal and vegetable food. This shows beyond question that when the diet is exclusively animal, the kidneys have more than double the amount of work to do than when it is vegetable in character; and that when partly animal and partly vegetable, they are required to do one-half additional and extra work. This excessive work must inevitably tend to the production of kidney disease, which is becoming a very common affection among the English and Americans, who, as is well known, eat more animal food than any other civilized nation.

Observation made under the writer's supervision showed that the work required of the kidneys by a non-flesh low protein diet is scarcely more than a third that demanded by the ordinary mixed diet.

Q. **Is there good authority for the elimination of flesh foods from the dietary?**

A. The sufficiency of a non-flesh diet is attested by practically all leading physiologists at the present time.

That a diet from which animal protein is wholly excluded is safe and competent is attested by all modern physiologists. Says Prof. D. Spence in Von Noorden's monumental work on metabolism: "The old question as to whether

the protein of vegetable origin is in respect of value as a foodstuff equal to that of animal origin —whether onnivorous man, like the herbivora, could with impunity draw his entire supply of protein from the vegetable kingdom alone, is in principle one which is already decided for us through the practice of those people who live exclusively on vegetable foods. Physiological investigation can therefore only supply the evidence that it is indeed true that the vegetable-albuminous substances as they occur in nature are equal in nutritive value to an equivalent quantity of protein of animal origin."

Says Dr. A. E. Taylor, professor of physiologic chemistry in the University of Pennsylvania, in his "Chemistry of Digestion and Metabolism," "A proper vegetarian diet is in every way a normal and competent diet. Plant proteins contain the same amino-acids as animal protein and all are there present in abundance. It is quite immaterial to the body whether it forms its two stock proteins from amino-acids derived from plant protein or from animal protein."

Professor Milroy (Von Noorden's "Metabolism") thus incidentally at once endorses and commends the low protein diet as a means of prolonging life and increasing efficiency:

"To arrive at a diet rich in energizing material and poor in protein, one that may also offer variety and be sufficient for the bodily requirements, is the endeavour of the scientist.

"However, such a doctrine will not attract too many admirers, or at least will not bring them in as adherents, for the majority of men, even with the tempting prospect of prolongation of life, or

at least rejuvenation, prefer to enjoy the comforts of life." What *is* comfort?

Effect of Meat Diet on the Kidneys

Q. **Does flesh diet injure the kidneys?**

A. The use of a flesh diet imposes upon the kidneys a large amount of extra work which must lessen their efficiency and gradually lead to degenerative processes which make their presence known by albumin and other evidences of kidney disease.

More than two-thirds of the meat eaten by the mixed feeder is at once eliminated by the kidneys as waste matter, and serves no useful purpose in the body. Meat contains much uric acid which the liver of man is unable to convert into urea as does the liver of a dog or other carnivorous animal, a strong argument in favor of the biologic diet.

The decomposition of the undigested remnants of flesh in the colon, floods the tissues with putrefaction poisons which give rise to the multitudinous ills of autointoxication.

Laborers Do Not Require Meat

Q. **Is it not true that laborers universally require a large amount of meat?**

A. The Arabs who built the Suez Canal lived upon wheat and dates and De Lesseps, the great engineer, who projected and successfully completed this remarkable work was so impressed by observing the great superiority of the wheat fed Arabs over the beef fed Englishmen engaged in the same work that he became a flesh abstainer and an earnest advocate of the

low protein regimen and continued so until his death many years later. Italian laborers, Irish laborers, and in fact, the peasantry of all countries including those of the populous region of India, Japan, Siam and Central Africa, are practically vegetarians. The reason why American working men when engaged in hard labor use a considerable amount of meat is that meat is a part of the ordinary diet. When the laboring man has hard work to do his appetite increases and he naturally increases the quantity he eats, not simply as regards the meat but with reference to all the foodstuffs which make up his bill of fare. He simply eats more of everything which he ordinarily eats not knowing that his increased energy output calls for an increase of carbohydrates and fats rather than an increase of protein. When the scientific facts relating to human nutrition are made as familiar to the average school boy as are the rules of arithmetic, then the workman will be better advised and when hard work is required of him, will increase his consumption of bread, potatoes and fats, instead of increasing his protein intake. Science has clearly shown that protein is a far less economical source of energy than fat and carbohydrates.

Waste of Food in the Fattening of Animals

Q. **Is it true that there is an actual waste in the feeding of animals to fatten them for food purposes?**

A. According to careful experiments by Professor Henry, Dean of the Agricultural Department of the University of Wisconsin, an enor-

mous amount of food is wasted in the feeding of steers, sheep and hogs. For example, Professor Henry has shown that for one hundred pounds of food fed to a milch cow, eighteen pounds of solids are reproduced in the milk. For a hundred pounds of food fed to fowls, only five or six pounds can be recovered in the form of poultry and eggs. In the fattening of steers the loss is still greater; for each hundred pounds of food fed to the animal, only 2.8 pounds are recovered in the form of edible flesh. In other words, the fattening of cattle and sheep requires thirty-five to forty pounds of vegetable food to produce one pound of actual food in the form of beef and mutton. More than half of all the corn raised in the United States is fed to domestic animals, involving a loss of food sufficient to feed all the people of the United States.

According to Dr. Lusk, the English authorities on feeding have found that the finest, well fattened, stall fed cattle furnish only one pound of digestible foodstuff in return for 100 pounds of digestible food material.

Poultry

Q. **Is the flesh of fowls preferable to beef and mutton?**

A. It was formerly thought the flesh of fowls, particularly the white meat, contained less uric acid and on this account was preferable but according to Taylor, and other physiologists, the flesh of fowls contains more uric acid than beef or mutton. The same is true of veal.

Is Meat Fattening

Q. **Is a meat diet fattening?**

A. Lean meat is not only a poor fuel but is also the worst diet that could be chosen, when it is desired to secure a gain in flesh.

Says Taylor: "It would be difficult to select another diet that would lay on as little flesh and fat as a pure meat diet. Entirely apart from the consideration of the dynamogenetic aspect of the diet, the enormous labor imposed on the catabolism of protein and the elimination of the end products renders the diet highly undesirable. Even in the pure carnivora, the experience of breeders and trainers of dogs is unanimous to the effect that a pure meat diet is unadapted to the best functionation of these animals, as well as to their best growth and work. A dog will work on a pure meat diet and labor hard if forced. But coursing trainers have long had the experience that "meat gives no wind;" in other words, the maintenance of work is accomplished even in carnivora in the most effective manner on a diet composed of a moderate ration of protein and a large input of carbohydrate.

"A rich protein diet is not a ration that makes flesh. A pure meat diet forms very little flesh."

Meat Diet in Cold Climates

Q. **Is a meat diet necessary in cold climates?**

A. The prevalent notion that meat diet is essential in cold climate seems to be contraindicated by well known scientific facts.

Gautier, in his authoritative work on "Alimen-

tation," presents the results of exhaustive study of the question whether or not an increase of proteid or albuminous foodstuffs is required during cold weather. With the temperature decreased nearly to the freezing point, the amount of nitrogen found in the urine was only 4.2, or practically the usual amount. The author states that there is no sensible increase in the loss of proteid substances as a result of the exposure of the body to cold. The demand for increased heat is met by the addition to the daily ration of carbonaceous foodstuffs, such as fats or carbohydrates.

Entirely in harmony with these ideas is the fact noted by Lieutenant Shackleton and other travelers in the Arctic regions that exposure to extreme cold develops a very great craving for farinaceous foodstuffs.

Stephansson reports that one of his lieutenants became very ill on an exclusive flesh diet and was obliged to eat frozen seal liver to save his life. It is impossible to live exclusively on flesh food unless one eats the entire animal for the necessary lime is all in the bones of the animal and the essential vitamines are in its liver and kidneys.

Animals Injured by Meat Diet

_Q._ Is a meat diet injurious to carnivorous animals?

A. Dr. Watson of Edinburgh in experiments upon rats made under the supervision of Prof. Schaefer showed that when fed upon an exclusive meat diet there were very marked evidences of degeneracy, affecting especially the re-

productive system. The number of young was greatly diminished and there was atrophy of the mammary glands.

According to Distaso, an eminent Italian bacteriologist, all carnivorous animals suffer from autointoxication, and it is for this reason that they become senile prematurely and are short-lived. The only exceptions are the eagle and other animals with very short colons and which eat their prey while the flesh is still warm and quivering.

The flesh of hogs fed upon a meat diet is unwholesome and has a repulsive flavor.

Japanese Diet

Q. **What is the Japanese diet standard?**

A. Some years ago, when the question of the deficiency of protein in the Japanese dietary was raised by Mori, a special investigation was undertaken by a Japanese physiologist, Kumagawa, for the purpose of settling this question. He found that with the ordinary diet of Japanese foods only 54 grams of protein were taken in, less than half the amount required by Voit, and still less than Atwater's standard. He found that this diet furnishes the body a larger amount of protein than it actually required and reached the conclusion that a larger amount of protein than this is quite unnecessary; that only a very small amount of protein is needed, the only important point being that the body shall be furnished with a sufficient amount of fat and carbohydrates to maintain the supply of energy required by the tissues. He found also that an increase in the protein intake did not increase the

amount of protein in the blood but only increased the amount of protein found in the excretions.

The Endurance of the Japanese

Q. **Are the Japanese short of stature because they do not eat meat?**

A. According to the *London Lancet* (1904), the Japanese attribute their remarkable endurance for which they have become world famous to their simple non-flesh dietary. The fact that they are smaller than some of the other nations in stature having been attributed to their non-flesh diet, the Japanese government determined to make an investigation of the matter. According to the *Lancet*:—

"In 1899 a commission was appointed to consider whether by a meat diet or by other means the stature of the race could be raised; but the conclusion arrived at was that seeing that their feats of strength and enduring powers were superior to races much taller than themselves, the lowness of their stature did not matter. Although during the period of their ascendency the Samurai kept the secret that their great physical superiority was due in a large measure to the internal and external use of water, the belief that if used liberally and intelligently, water is an infallible weapon against disease, is now generally held. By those who go in for *jiu-jitsu,* an average of one gallon a day is drunk. . . . All that is really required by the people is that the water shall be pure. By the copious ingestion of water the action of the bowels and kidneys is stimulated, and it is note-

worthy that rheumatism is almost unknown in Japan; it is probable that the absence of meat from the diet, combined with the use of plenty of water, accounts for this immunity. Bathing is indulged in frequently even by the poorest. The water in the bath is heated to a temperature which would be impossible for an Englishman to endure,—generally by a stove underneath the bath. These hot baths are taken to cleanse and stimulate the skin, but cold baths also are taken to invigorate and harden.

"Vegetables and fruits are grown in abundance, and their value as a regular part of the diet is realized far more than in this country. Indeed, a laborer is content to work a whole day on a dinner of tomatoes, cucumbers, and salad. Salad is eaten cooked, as a cure for sleeplessness.

"Milk is scarce because it does not pay to keep cattle to produce milk alone, and the meat is not eaten."

The fact that within a single generation the Japanese have made more progress in civilization than any other nation has made in two hundred years, very clearly shows that notwithstanding their diet practically excludes flesh foods, they are in no way inferior in intrinsic intellectual power to the people of other countries in which flesh food is largely used.

The intellectual activity, the progressiveness and the remarkable strength and endurance of the Japanese on a non-flesh dietary is a complete answer to the argument based upon the fact that the many millions of flesh-abstaining

East Indians are ruled by a handful of flesh-eating Englishmen. The absurdity of this argument is further shown by the fact that there are in India, besides the 200,000,000 flesh abstainers, not fewer than 100,000,000 Mahometans, who are flesh-eaters.

Does Protein Develop Muscular Strength

_Q._ Will not the free use of protein encourage the development of the muscles?

_A._ This question has been much studied by trainers and physiologists and it has been scientifically proven that even though the size of the muscles may be somewhat increased by flesh eating, the muscular strength is not at all increased in this way. It is only by exercise that real muscular development and increase of strength can be secured.

Safety of the Low Protein Diet

_Q._ Is a low protein diet safe for all persons? If not what are the exceptions?

_A._ Protein is required only for tissue repair. The condition under which the most protein is needed is when the body is growing. If any person needed a high protein diet, it would be the human infant, but Nature supplies the infant with a low-protein diet. An infant fed on mother's milk gets a very small amount of protein. The amount is less than one calorie a day per pound, which is less than one-third the amount usually eaten by adults. In other words, the infant is supplied by Nature with a very low-protein dietary. This fact clearly shows that human beings are not adapted to a high-protein diet, but

the reverse. Physiologists tell us that a high-protein diet does not increase the formation of flesh but has the opposite effect, that the carbohydrates are the real flesh formers. They promote the formation of flesh by preventing the destruction of protein and so encourage tissue increase.

Beef Tea

Q. **Is beef tea of any value as a food?**

A. Beef tea is made up of excretory products such as go to form the urine. The urine is not formed by the kidneys but consists of waste substances resulting from tissue work and is washed out of the tissues by the blood, then later filtered out of the blood by the kidneys; so urine is simply an extract of the tissues. Beef tea, is also an extract of the tissues. One extract of the tissues is made by the kidneys, the other by the cook. Examination by chemists show that the two extracts are practically identical; in other words the composition of beef tea and of the urine are essentially the same.

Bouillon—Beef Extract—Animal Broths

Q. **What is the value of bouillon or extract of beef as food?**

A. Bouillon and meat extracts of all sorts are valueless as foods; in fact they are worse than nothing at all. A dog fed on extract of beef dies sooner than if fed nothing at all. The popular idea that these meat extracts represent concentrated food value is the very opposite of the truth. The amount of nutriment contained in a pint of beef tea is less than that found in a

thimbleful of wheat flour or corn meal. The chief constituents of bouillon and meat extracts are waste substances of the same character as those which are found in the urine. Practically the only way that a chemist can tell the difference is by the sense of smell, as the chemical analysis is essentially the same. The late Dr. Austin Flint, the great New York physician, called attention to this fact more than forty years ago and insisted that thousands of people had been starved to death on a diet of meat broths.

Modern science has produced from yeast a vegetable extract which possesses all the desirable qualities of beef extracts without the uric acid and other objectionable features. It is sold under various names, among which are Savora and Marmite.

Meat Flavors

Q. **Are meat flavors exclusively found in meats?**

A. No. Mushrooms and other fungi possess almost identical flavors. Dr. Lusk, an eminent New York physiologist and one of the leading physiologists of the world, thinks that flesh foods are attractive chiefly because of their very pronounced flavors, and suggests that these flavors might be utilized without a large consumption of meat, thus avoiding the evils which arise from a high protein diet. This is an excellent idea, and it may be improved upon by the suggestion that it is possible to get the flavors which render meat agreeable without eating any meat at all. The seeming paradox of this statement disappears when it becomes

known that the flavors of meat are associated with the protoplasm of the living cells of which the meat is, in part, composed, and that the same flavors are also possessed by the protoplasm of vegetable cells.

It has long been known that common yeast is very rich in this meat-like protoplasm, and in recent years methods have been devised by which meat flavors may be separated from yeast and used for the flavoring of soups, and in the preparation of bouillons, the same as meat extracts. Yeast extracts, in fact, so closely resemble meat extracts in flavor, as well as in appearance, that even experts might easily be deceived. The essential differences are that the yeast extract is superior in flavor, lacking the glue taste which is so often a special feature of meat extracts; besides the yeast extract contains no uric acid, and is wholly free from the putrefactive products which are very likely to be found in meat extracts.

These yeast extracts can be used for every purpose for which meat extracts are used, and are in every way superior. Many different brands are now prepared and supplied under various names, as "savora," "millennium" extract, etc.

Soups

Q. **Are soups, especially those containing meat, good for one whose digestion is weak?**

A. Soups properly made are wholesome, but soups made from meats are unwholesome under all circumstances. Such preparations contain a large proportion of uric acid which, as shown by

Dr. Haig and others, is very damaging. In taking soups, one should remember that liquids, as well as solids, require mastication. Each spoonful should be held in the mouth while movements of the tongue and the jaws are made as in mastication, until it is so far diluted by the addition of saliva that the taste has largely disappeared.

When they are taken in this way, soups are among the most digestible of all food preparations.

Fish

Q. **Are fish preferable to other forms of flesh?**

A. The popular idea that fish are more easily digested and more wholesome than red meats is entirely an error.

According to Professor J. Roger, fish are more liable to disease than other animals.

Roger gives a long list of poisonous fish.

Brieger, as well as others, who have made a careful study of this subject, have isolated numerous ptomaines which are found in the flesh of fish.

Meat Poisoning

Q. **What is so-called meat poisoning?**

A. Dr. H. E. Durham, F. R. C. S., stated in the *British Medical Journal:* "It is clear that the flesh of cows and calves has been accountable for many deaths." The disease has been traced to the use of pork and other flesh and in some instances to the use of milk. Dr. Durham reported 256 cases of illness from this cause, of whom nine died.

It is important that these facts should be made

widely known, as the symptoms of meat poisoning, headache, nausea, diarrhea and abdominal pain are likely to be attributed to the use of fruit rather than to the real cause. It is more than likely that by far the majority of cases of meat poisoning are overlooked. It is not surprising that meat so often gives rise to intestinal disturbances when the fact is known that flesh foods of all sorts, including salted and dried fish, are swarming with bacteria, and to an extent far greater than in any other food which is eaten. Even milk in its worst stage does not compare with fresh butcher's meat in the number of bacteria contained in a given weight. It is true that these bacteria are generally the ordinary bacteria of putrefaction, that is, such bacteria as are found in a dead rat or in a decayed carcass anywhere. But these, even though in general capable of producing in a healthy adult the symptoms which follow the use of meat infected with the bacillus enteritidis, in feeble persons and especially in children may produce a serious attack of acute intestinal infection, and when habitually used will certainly in time give rise to intestinal catarrh and autointoxication with its variety of far-reaching consequences.

Meat Bacteria

Q. **Do meats and fish as purchased always contain bacteria?**

A. Professor Tissier of the Pasteur Institute found it impossible even when using the greatest care, to obtain flesh from a slaughtered animal which was not contaminated with putrefactive bacteria.

The following table shows the number of bacteria found in different samples of meat freshly obtained and examined in the clinical laboratory of the Battle Creek Sanitarium:

		Putrefactive Bacteria per Ounce	
	Specimen	When Purchased	After 20 Hours at Room Temp.
1.	Large sausage	12,600,000,000	14,700,000,000
2.	Small sausage	19,800,000,000	19,200,000,000
3.	Round steak	16,800,000,000	25,200,000,000
4.	Roast beef	16,800,000,000	22,500,000,000
5.	Smoked ham	1,293,600,000	22,500,000,000
6.	Hamburger steak	3,870,000,000	21,000,000,000
7.	Pork	3,781,000,000	31,080,000,000
8.	Porterhouse steak	900,000,000	21,000,000,000
9.	Sirloin steak	11,340,000,000	....
10.	Tenderloin (well done)	756,000,000	....
11.	Tenderloin (rare)	5,040,000,000	....

Cold Storage Meats

Q. **Are cold storage meats safe?**

A. Modern research has shown that cold storage does not prevent the growth of bacteria. The putrefactive organisms with which all slaughtered animals become infected continue to grow notwithstanding the low temperature to which the dressed carcasses may be subjected in cold storage. It has been found that a special class of these putrefactive organisms are able to thrive at a low temperature. These organisms differ from those which grow in higher temperature in the fact that they do not produce aromatic substances and hence do not reveal their presence by any taint or change of odor. The flesh smells as sweet as though perfectly fresh, notwithstanding the fact that myriads of bacteria are swarming all through it. It is well known that flesh of any sort which has been kept in cold

storage for some time undergoes decomposition very rapidly when removed to a higher temperature. The reason for this is now plain. The development of putrefactive organisms has been going on in the flesh, notwithstanding the low temperature at which it has been kept, so when exposed to a higher temperature a prodigous development occurs within a very short time. If flesh is eaten at all it should be eaten as soon as the animal is killed, if possible even before rigor mortis or death takes place. But the use of flesh food is wholly unnecessary.

Oyster Juice

Q. **Is oyster juice a wholesome food for sick people?**

A. Oyster juice has essentially the same properties as urine. Oyster juice appears in fact to be the result of action of the kidneys and intestine of the oyster. An analysis made of oyster juice in the laboratory of the Battle Creek Sanitarium showed its composition to be essentially the same as that of urine. It contains a large amount of urea and other substances which are found in urine.

As is well known, these mollusks are the scavengers of the sea. They subsist upon the decomposing organic matters which they find in solution in the water in which they live. For greater convenience in marketing, extensive beds of oysters and clams are planted near large cities; and it not infrequently happens that they feed and fatten on the filth from sewers which empty into the sea in the vicinity of the beds, or which is brought to them by the tide.

Numerous observations made in different parts of the world have shown that epidemics of typhoid fever may not infrequently be traced to the use of oysters. Typhoid fever germs are frequently found in the stomachs of these bivalves.

In France and Belgium, oysters are made, if possible still more unwholesome by keeping them for several months in stagnant water until they become bloated and green when they are served up to tickle the depraved palates of French gourmands.

"Ripening Beef"

Q. **Does "ripening" beef, commonly practised by butchers, improve its qualities from a health standpoint?**

A. No. A writer in a popular magazine tells us that "the flavor of red meats, like beef and English mutton, depends upon a purely chemical change that takes place during the process of 'ripening.' When the animal is killed, stiffening of the muscles immediately follows. In this stage the content of each muscle fiber is a hardened jelly, and if the meat were cooked in this condition, it would be tough and lacking in flavor. It is because of this that fresh-killed beef is never well-flavored beef, however fine the quality. It is because of this that often a steak cut from an expensive loin is tough. Your butcher has sold you too 'fresh' beef.

"If this fresh-killed meat is allowed to hang in a proper temperature for ten days, a wonderful change takes place within the muscle fiber. The jelly becomes liquid. In composition it changes into sugars and flavoring extracts. All

of this makes the meat not only tender but sweet in flavor, and of a delicious aroma."

The process of ripening is nothing less than a process of decay. The changes which take place in a piece of beef hung in a butcher's stock room are precisely the same as those which take place in a dead cow or pig in a fence corner of a pasture lot. A dead animal decays, whether buried in the ground or displayed in a butcher shop. The idea that "ripening" is rotting, as applied to meat, is not appetizing, but it is nevertheless the truth.

Flesh Eating and Ferocity

Q. **Does flesh-eating tend to develop ferocity of disposition?**

A. It has long been known that tame bears, while not of a ferocious disposition, are sometimes made unmanageable when fed raw meat. Dr. Harry Campbell, a prominent London physician, believes that man has become ferocious through his carnivorous habits. He says:

"The fact that carnivorism makes for ferocity and develops the fighting instinct has this interest—that man is himself carnivorous. Indeed, in the matter of slaughter he leaves all other animals far behind. He is the arch slaughterer—*facile princeps.* Since the time the pre-human ape took to hunting he and his human descendants have wrought ruthless havoc among the lower animals, and at the present day man not only hunts them, but breeds them for the express purpose of destroying them, chiefly for food, partly for amusement. Many a person of gentle nature would be amazed and

horrified were he at the end of a long life to see *en masse* the hecatombs of living things done to death on his behalf."

Dr. Campbell's frank admission that flesh-eating, with the slaughter-house and other cruelties which it involves as a part of the civilized man's environments, tends to foster and maintain in him the brutal qualities which are manifested in the barbarities and cruelties of war, is a recognition at last of a contention made by flesh abstainers of all ages, from Pythagoras and Seneca to Shelly, Lord Byron, Tolstoi and Bernard Shaw.

The Typhoid Oyster

Q. **Is it true that the oyster is a carrier of typhoid fever germs?**

A. Yes. Many accounts have appeared in sanitary journals of extensive outbreaks of typhoid fever which were traced to the eating of raw oysters. In an epidemic which developed in the city of Binghampton, New York, and surrounding cities, fifty cases of the disease were traced to oysters supplied by two wholesale dealers. It is probable that the oyster is much more frequently the cause of typhoid outbreaks than is known since the source of infection is in many cases not discovered and, of course, every outbreak begins with a first case which may be the cause of the others. When it is found that a man or woman harbors typhoid fever germs the person is immediately labeled a typhoid carrier and is placed under quarantine. Typhoid Mary was for years held a prisoner on Ward's Island, although not guilty of any crime

or misdemeanor. It has been shown repeatedly that the oyster is a typhoid carrier and it is high time that the slimy creature was put in quarantine and kept there until the appetite of the public for the "scavenger of the sea" has abated. As it is not practical to quarantine the special oysters that are carriers of typhoid germs, the only alternative is for people to cease to expose themselves by swallowing the scavengers.

Ptomaines

Q. **What are ptomaines?**

A. These are poisonous substances which are formed whenever animal flesh undergoes putrefaction.

That ptomaines are not only present in the intestinal contents, but that they are absorbed and circulated through the body and thus brought in contact with all the tissues is clearly shown by the fact that they have been recovered from the urine. Numerous observers have found cadaverin, putrescin and other ptomaines in the urine of various subjects in different forms of disease.

Mould

Q. **Is bread or other food unfit to eat when mould appears upon the surface?**

A. When mould is present on the outside of a loaf of bread, the spores are certain to be present in great numbers in the loaf itself, such food is unfit to be eaten, at least without sterilizing. Such bread, if the mold is slight, may be made wholesome by cutting into slices and toasting till hard and crisp.

Mould is produced by spores which are constantly present in the air and which mingle more or less with all the foods we eat. The spores of moulds are present in great quantity in such foodstuffs as bread, crackers, and other bakery products.

M. Pietro, an Italian investigator, in the study of pellagra made the discovery that the common green mould, known as penicillium glaueum produces a highly toxic substance in its spores. This toxin is active when introduced into the stomach or into the skin. Dogs, rabbits and guinea-pigs are sensitive to its effects as well as human beings. The poison of green mould produces muscular trembling, paralysis, spasms, and other symptoms which in many respects resemble the symptoms of pellagra.

Old cheese always contains mold. Certain varieties of cheese, such as brie and cammembert cheese, contain much mold. Fresh cream cheese and cottage cheese do not contain moulds. In the light of the above facts, mouldy food is unfit to be eaten. Persons whose stomachs make no gastric acid must especially avoid mouldy foods for the reason that the moulds may attach themselves to the stomach walls and become a permanent source of infection of the food.

Eggs Sometimes Poisonous

Q. **Why do eggs sometimes produce poisonous effects?**

A. Recent studies which have been made of eggs, especially by a French physiologist, have shown that all eggs contain small quantities of albuminous compounds which behave like toxalbumins. Some people are very susceptible to these toxins, and on this account are unable to eat eggs of any sort without suffering decided symptoms of poison such as urticaria, frequently nausea and vomiting and diarrhea with great prostration.

Certain persons are sensitized to egg albumen. By the application of a newly devised test, it may be determined in a few hours whether or not a person is sensitized to milk or any other food.

Eggs Rarely Needed

Q. **How many eggs per day should one eat to secure the proper amount of protein?**

A. The daily ration of the average individual should contain a calorie of protein for every pound of his weight. That is, the average man weighing 140 pounds net, requires 140 calories of protein daily. This amount of food is furnished by five eggs. A pound loaf of bread, however, will furnish more than this amount of protein. In fact, one needs to take pains to avoid protein, for the universal dietetic error is the use of too much of this food element. Two or three glasses of milk with a variety of vegetables, fruits and cereals will insure a full supply of protein.

Eggs and Toxemia

Q. **Do eggs encourage intestinal putrefaction?**

A. Van Noorden ,and several other European investigators have been studying the effects of eggs upon intestinal putrefaction. Their verdict is that eggs, particularly the white of egg, when eaten in excess, is capable of increasing intestinal putrefaction to a very marked degree. This is true even when the eggs are taken very fresh, and especially when hard cooked. When eggs are slightly stale the ill effects are greatly increased because of the germs which are already contained in the eggs, and which rapidly develop putrefaction if the eggs are taken into the stomarch.

The free use of eggs, especially of the white of egg, is found to be injurious in many cases of Bright's disease. Eggs encourage the growth in the colon of the germs of putrefaction, which have been proved to be the cause of membranous colitis and of appendicitis.

Bad Eggs

Q. **When is an egg bad?**

A. An agent of the U. S. Agricultural Department, who has for many years made a study of eggs gives us the following information about good and bad eggs:

"The fresh, sound, shell egg is for practical purposes free from bacteria, though it is not always sterile. It is free from organisms of the colon group so far as we know. 'Stuck spots,' 'mold spots,' definite blood rings, 'white rots,'

eggs with a pronounced odor, 'grass eggs,' (those having a greenish color in the egg white), 'musty eggs,' and 'sour eggs,' that is eggs having a pungent quality which is difficult to describe but which is recognized by the trained sense of smell, are ordinarily possessed of a high bacterial content. 'Grass eggs,' 'musty eggs,' 'sour eggs,' and eggs having a pronounced odor cannot always be excluded by the candler. The others can and should be. The great majority of 'seconds,' 'heated eggs,' dirty shell eggs, and cracked eggs (not those from which the contents are escaping) show but few bacteria present when studied in the producing section. When cracked-shell eggs are kept, even for a few days, they frequently become infected with molds and bacteria.

"Cracked eggs, or 'checks,' as they are called in the trade, dirty shell eggs, and 'seconds,' which signifies a grade including undersized, soiled, 'checked,' and stale eggs, are commonly used by egg breakers. No 'spot' eggs of any sort are used by reputable breakers.

"Eggs in which the pungency of sourness is just beginning, eggs in which the faintest green of the 'grass egg' can just be detected, and eggs that show a tendency for white and yolk to mix together but which are not, strictly speaking, 'rots,' must be further investigated in order to fix the dividing lines between good and bad eggs more sharply and definitely. This study is now under way, and the investigation of all the kinds of individual eggs will be continued, since we cannot have too much information on the subject.

"Examination of eggs which had been commercially candled for breaking were made at different times during the summer of 1911 in six different factories scattered over a fairly large area of the producing section, and perfectly uniform results were obtained *with the exception of the eggs having green-colored whites, musty eggs, sour eggs, and eggs with pronounced odor, already mentioned, and which the candler cannot distinguish,* the eggs going to the breakers after a competent, careful candling are, bacteriologically speaking, a clean, wholesome food."

Infected Eggs

Q. **Do eggs which are perfectly fresh contain germs?**

A. Yes. Rettger has discovered that a germ found in eggs, the *Bacterium pullorum,* is a very active disease-producing organism. When it was added to the food of rabbits, kittens, guinea-pigs and white rats they soon sickend and died.

The symptoms produced were similar to those produced by the typhoid germ. Experiments made by inoculating through a minute puncture in the shell, showed that the germs grow rapidly in eggs at ordinary temperature.

The experiments showed that the *Bacterium pullorum* is an organism of such virulence that it is without doubt highly dangerous to human beings, especially to young children and invalids.

In a report of the most recent investigations we are given this warning, which ought to be brought to the attention of the public as speedily as possible.

"Ovarian infection of fowls is very common throughout the country. Hence a large proportion of the marketed eggs are infected with *Bacterium pullorum.* When such eggs are allowed to remain in nests under broody hens or in warm storage places for comparatively few hours they contain large numbers of the organism.

"Soft boiling, coddling and frying on one side only do not necessarily render the yolks free from viable bacteria; therefore eggs which have gone through these processes may, like raw eggs, be the cause of serious disturbances in persons who are particularly susceptible to such influences, and especially infants."

It is evident, then, that eggs must be classed with foods which cannot be recommended without qualification. Their use by young children should be prohibited altogether and when given to invalids great care should be taken to prepare them in such a way as to render them sterile.

Boiling for fifteen minutes will probably destroy the *Bacterium pullorum.* The white of eggs cooked in this way is difficult of digestion but the yolks are mealy and readily digestible.

Egg White Indigestible

Q. **Is raw egg albumin a wholesome food for infants mixed with milk, or in the form of egg-nog for adults?**

A. No. Observation made by Vernon, Hetin and numerous other investigators shows that the raw white of egg not only is not acted upon by the digestive fluids but that it hinders the digestion of other food substances.

It appears then that instead of being easily digested the raw egg white passes through the stomach like a neutral substance such as to water. Cooked white of egg, however, is free from any of the objections. It is acted upon by the digestive fluids and undergoes ready digestion.

Steinitz noted that raw egg white caused vomiting and diarrhea in dogs. Further investigation has shown that diarrhea is always produced and vomiting is frequent. Five egg whites given to a fifteen pound dog caused very severe diarrhea. The stools were not only loose but had an extremely offensive odor and contained a great deal of mucous, indicative of very active putrefaction and marked infection. Even when small amounts of raw white of egg are fed the egg albumen can be recovered from the stools unchanged. Careful studies show that even when given carefully and for some time only about half of the quantity given was utilized, the remainder appearing in the stools undergoing active putrefaction. Dogs fed on cooked egg white did not suffer from diarrhea and the material was well digested and utilized.

These peculiarities of raw egg white disappear when it is cooked at a temperature of 160° F. At this temperature the egg white is thoroughly coagulated but remains soft and jelly like. Egg yolk on the other hand was found to be very easily digestible when eaten either raw or cooked. Careful experiments have shown that raw egg white has no food value when introduced into the colon and hence it should not be used in rectal feeding. Another objection to the use of raw egg white is the readiness with

which this substance is absorbed into the blood, producing anaphylaxis. This objection applies, however, to cooked egg white as well as raw.

The peculiar effect seen in persons who are sensitized against egg is said to be due to ovo mucoid which the egg contains. Egg white contains also three other substances, ovo globulin, ovo albumin and con albumin. Albumin is shown to be the cause of diarrhea. The amount of white of egg required to give rise to anaphylaxis is extraordinarily small. This effect has been produced in guinea pigs by less than one millionth of a grain of egg white.

From the above facts—for which we are indebted to an interesting article by Bateman, in a recent number of the *American Journal of the Medical Sciences*—it is evident that the practice of giving raw eggs to invalids with or without milk feeding and the use of white of egg in the feeding of babies are not only valueless but are really more or less dangerous. Eggs should always be cooked. They need not necessarily be boiled but should be exposed to a temperature of not less than 160°. A higher temperature than this is necessary to destroy the bacteria which are frequently present in eggs. On the whole, eggs must be regarded as rather a questionable article of food and should be eaten sparingly if at all.

According to Bayliss, the eminent professor of physiology in the University of London (The Physiology of Food and Economy in Diet), raw white of egg contains some substance which, even in very small amount interferes with the

action of the digestive fluids. Cooking destroys this substance.

Egg Yolk

Q. **What is the food value of egg yolks?**

A. Egg yolk is a very remarkable substance, containing all the elements necessary for complete nutrition, including a rich store of lime and iron and other salts, with an abundant supply of vitamines. Nothing is forgotten. The yolk is the sole substance of the young chick while it is undergoing development in the shell, and when it leaps out of its prison house it is fully equipped to enter upon its life career, and to thrive upon the foodstuffs which it finds ready at hand. It does not have to be nursed or brought up on a bottle. It needs only to eat, exercise and grow. The yolk of the egg supplies it with everything needful for its complete life equipment.

It is evident, then, that the egg yolk is a very exceptional food, and naturally one would expect it to be, for the reason that nature has prepared it to serve as a whole bill of fare, capable of supplying everything needful for the development of the animal from embryo to self-support. Nature is no bungler. She is an expert workman.

Cow's Milk and Human Milk

Q. **What is the composition of cow's milk and does it differ from human milk?**

A. The difference between cow's milk and human milk is clearly shown in the accompanying table:

COW'S MILK.

Water Per Cent	Protein Per Cent	Fat Per Cent	Carbohydrate Per Cent	Ash Per Cent
87.17	3.55	3.64	4.88	.71

HUMAN MILK.

Water Per Cent	Protein Per Cent	Fat Per Cent	Carbohydrate Per Cent	Ash Per Cent
87.41	2.99	3.78	6.21	.31

From the above, it will be seen that mother's milk contains about one-half more sugar than does cow's milk and only two-fifths as much lime salts. It also contains less protein. The protein also differs in character. The casein of cow's milk forms hard, tough curds, that of mother's milk soft curds. The digestibility of cow's milk is increased by adding water. For a young child, an equal quantity of water is added, and an ounce of malt sugar to each quart.

Milk With Fruit

Q. **Is it unwholesome to combine cream or buttermilk with stewed or fresh fruits?**

A. The popular notion that milk and acid fruits are an unwholesome combination is an error. The first step in the digestion of milk is its conversion into curds. It is evident that if milk is curded before it is eaten no harm is done. The milk has simply advanced one step along the process of digestion. The addition of cream to

fruit is advantageous. With persons who have a tendency to formation of an excessive amount of gastric acid, the tendency of acid fruit to increase the secretion of acid by the stomach may be checked by the addition of cream since it has been shown by Pawlow that fats tend to diminish acid secretion.

Sour Milk

Q. Would milk soured be a wholesome and beneficial drink?

A. Sour milk is more digestible, and probably on the whole more wholesome, than ordinary fresh milk.

Skimmed Milk

Q. **Is skimmed milk a valuable food?**

A. Yes. The food value of skimmed milk is only about half that of full milk because of the removal of the fat, but it nevertheless contains elements of the highest value, and not a drop should be wasted.

Under the direction of the Department of Agriculture, forty-seven women, who have received several months' intensive training, started out on April 1st to teach the making of cottage cheese, which the department wishes to bring to the attention of housekeepers as a valuable and economical meat substitute.

The Department of Agriculture says that 30,000,000,000 pounds of skimmed milk is wasted annually or fed to animals. By converting this partial waste to use as human food many millions of pounds of meat may be saved. "Eat one pound of cottage cheese, which has a food

value of one pound of meat, and cut your meat bill in half," says the Department.

Milk Sterilized by Light

Q. **Can milk be sterilized by light?**

A. Yes; that the actinic, or chemical rays of light destroy disease germs has been determined by numerous experiments. This disinfecting property is possessed by the rays of the arc light as well as by sunlight. Recent experiments by Henri and Stodel, reported to the French Academy of Sciences, have shown that milk may be sterilized by chemical light rays. The sterilization was complete, even when the milk has been contaminated to a very high degree by the addition of artificial cultures.

Other investigators have sterilized water by immersing the lamp in the water. An arc lamp of four amperes and 135 volts sterilized a keg of water twenty-four inches in diameter in two minutes. This is an important discovery and may, in the future, be utilized as a means of purifying water supplies.

Buttermilk

Q. **Is fresh creamery buttermilk injurious?**

A. Buttermilk is preferable to milk in the ordinary form. There are some persons with whom milk in any form disagrees, producing gas in the stomach, headache, coated tongue, and other unpleasant symptoms.

The fact must be borne in mind that some persons are sensitized to milk.

Buttermilk With Fruits

Q. **Should buttermilk be used with sweet fruits?**

A. There is no objection to the use of buttermilk with sweet fruits or fruits of any sort, provided careful attention is given to mastication of the fruit.

Milk Germs

Q. **Are milk germs dangerous?**

A. Few people are aware of the amount of dirt and dirt of the filthiest kind, which is consumed in the use of ordinary milk. It was recently estimated that more than twenty tons of cow manure are consumed as food disguised in milk by the inhabitants of the city of Berlin every year. If this is true of Berlin, the amount consumed by an equal population in the United States must be much greater; for far less attention is given to sanitary supervision of such matters in this country than in Germany. We are, in fact, just beginning to wake up to the importance of *keeping the drugstore and the barnyard out of our victuals.*

In a few states laws are now in force established a standard of purity of milk, or rather, we should say, a standard of impurity, for the standard is so low that milk which wholly conforms to it can not be considered as in any wise clean.

For example, in Michigan, where the standard is higher than in some States, the law demands that commercial milk shall not contain more than 200,000 microbes per cubic centimeter. A cubic centimeter is about one-fifth of a tea-

spoonful, so the actual meaning of the law is that a teaspoonful of commercial milk shall not contain more than one million germs, but of course it is impossible for inspectors to examine every specimen of milk offered for sale; consequently it is not an uncommon thing to find milk being distributed from door to door to be consumed by delicate invalids and feeble infants as well as by robust persons that contains as many as ten and twenty millions or even fifty millions, of germs to the teaspoonful.

Goat's Milk

Q. **Is it true that goat's milk is more digestible than cow's milk?**

A. The milk of the goat contains more casein than does that of the cow. It is also richer in fat. It forms a harder curd and is on this account less digestible than cow's milk. The idea advanced a few years ago that goat's milk is possessed of special curative virtues for persons suffering from tuberculosis of the lungs has been proven to be erroneous. The goat is less subject to tuberculosis than the cow only so long as it lives out of doors. When confined in a stable as cows are usually kept the goat becomes tuberculous.

Raw Milk

Q. **Is raw milk laxative?**

A. Raw milk when eaten freely is somewhat laxative. The milk sugar which it contains is slowly absorbed and on this account is generally in some part changed by fermentation to lactic acids which like all other acids act as a stimulant to the intestine and so encourage bowel

action. This is especially true when the quantity of milk taken is large enough to prevent complete absorption of the milk sugar in the small intestine. When some portion of the sugar finds its way into the colon and there undergoes fermentation a decided laxative effect is often produced. An exclusive diet of milk if sufficient in quantity is often accompanied by decided looseness of the bowels.

Milk Poisoning

Q. **What are the symptoms of milk poisoning or how may one know that milk disagrees with him?**

A. Many persons are sensitized to the protein of milk and cannot take milk even in moderate quantities without suffering various unpleasant symptoms. The most common symptoms of milk poisoning are coated tongue, headache, constipation, lack of appetite and bad breath. It is probable that an explanation of the symptoms is to be found in the fact that undigested curds find their way into the colon and undergoing putrefaction there give rise to intestinal toxemia. Person who suffer from colitis are very likely to show symptoms of milk poisoning because of the more rapid absorption through a diseased mucous membrane. Some persons observe that they suffer less when using milk very freely than when taking it in small quantities. This seeming paradox is easily explained. When milk is taken in small quantity all the sugar is absorbed in the small intestine so there is none left to feed the acid forming germs which may be present in the colon and so putrefaction occurs instead

of fermentation. When a large amount of milk is taken a considerable amount of sugar escapes absorption in the small intestine and passing on into the colon feeds the acid forming germs, which by fermentation produce lactic acid and other acids and so prevent putrefaction and encourage bowel action. The writer has demonstrated in many cases that persons who could not take milk in very small quantities without suffering unpleasant symptoms when given five or six quarts of milk a day in submitting to the milk regimen suffered no inconvenience whatever and were greatly benefited by the change of "flora" thus secured.

Viscid Milk

Q. **What is the cause of thready or viscid milk?**

A. More than a dozen different germs have been described which produce a thready or viscid condition of the milk. It is a singular fact that this condition of the milk is promoted as the basis of the process employed in the manufacture of Edam cheese. Conserves of thready milk are also made in Norway, where pains are taken to produce a viscid condition of the milk in the manufacture of a peculiar kind of preserved milk.

The Milk Diet

Q. **Is an exclusive milk diet to be recommended?**

A. Cow's milk is rarely indicated as an exclusive diet for adult persons. Cow's milk is exactly adapted to the nourishment of calves but is

by no means adapted to human requirements. Many persons have been sensitized to the protein of milk. Many persons who cannot take milk without injury are able to take the milk regimen with benefit. In the milk regimen fruit is taken twice daily and considerable quantities of agar-agar and other laxative substances are taken to insure free bowel action. If the bowels do not act freely the patient is likely to be injured rather than benefited. The bowels should move four or more times daily. If the bowels do not move freely the half digested curds accumulate in the colon in large quantities and undergoing putrefaction produce a highly toxic condition.

Buddized Milk

Q. **May milk be sterilized without boiling?**

A. Yes. By a process known as Buddizing, commercial milk may be rendered practically free from germs and apparently without in any way injuring the milk. The sterilizing agent is peroxide of hydrogen, which is added to the milk in the proportion of about a teaspoonful to the pint of milk. The milk must be kept for half an hour at a temperature of about 130° F. which permits the peroxide to act efficiently.

Buddized milk will keep several days with ordinary care. This method has long been in use in Denmark. It is also in use in one of the large hospitals of Chicago and by ice cream makers throughout the country.

Milk an Important Foodstuff

Q. **Is milk essential to a complete human dietary?**

A. Milk is certainly not absolutely essential to a human dietary, but it is a very convenient and highly useful article of food. It furnishes three essential food elements which are likely to be deficient in the ordinary diet. These are (a) an easily digestible and "complete" protein; (b) an abundant supply of lime. An ounce of milk contains three-quarters of a grain of lime. (c) The special vitamin which encourages growth and which is also important for maintenance. The protein of vegetables are for the most part, incomplete, and when taken alone do not supply all the elements necessary for repair of the tissues. When these proteins are supplemented by the protein of milk, however, they become utilizable. It is for this reason that bread and milk, corn meal and milk, potatoes and buttermilk, and similar dishes in which milk and cereals or farinaceous vegetables are associated are complementary combinations which are doubtless the result of an instinctive recognition of the biologic requirements of the body.

Growing children should receive at least one quart of milk a day to supply the lime, protein and vitamines necessary to promote vigorous growth. The average adult may use advantageously one pint of milk a day. Full milk is best, but skimmed milk is better than none. The enormous waste of skimmed milk in this country entails a great economic loss. Not a drop of milk should be wasted. All the milk produced in this country is needed by its human population. Hundreds of thousands of infants and young children are suffering be-

cause of the waste of milk through the feeding of animals and otherwise.

Cottage Cheese

Q. **Is cottage cheese, or cheese made from sour milk, constipating?**

A. There are some people who appear to become constipated whenever milk is used in any form.

Constipation is often due to the fact that the casein is not well digested, hence is not absorbed, but finds its way into the colon and there undergoes putrefaction, producing an alkaline state of the bowel contents which tends to constipation.

Yogurt Cheese

Q. **What is the difference between yogurt cheese and ordinary cottage cheese?**

A. Yogurt cheese is prepared by a process similar to that employed in making Camembert cheese without the green mould as is done in making Camembert cheese. The milk is sterilized so as to destroy moulds and germs which are found n ordnary cheese, then a protective ferment, *Bacillus Bulgaricus,* is added and finally the rennet extract. The curds are eaten fresh like cottage cheese. The flavor is improved by the addition of sterilized cream.

Cheese Poisoning

Q. **To what is cheese poisoning due?**

A. More than twenty years ago Dr. V. C. Vaughn of Ann Arbor, discovered in cheese which had caused symptoms of poisoning, a

special poison to which he gave the name "tyrotoxicon." It is probable that all cheese contains at least a small amount of this poison along with other poisons which are produced by the growth of germs. In some cases however, the amount of poison present is so great that within a few hours after eating cheese vomiting and violent pains in the stomach, purging with great prostration and other symptoms make their appearance, the result of the action of the cheese poison. The process of cheese making is due to the action of moulds or various germs which produce flavors characteristic of cheese by decomposing the casein, fat and sugar found in milk. If the milk is sterilized, cheese cannot be made from it since the whole cheese-making process depends upon the growth of germs.

Every eater of cheese ought to be informed of the fact that ripe cheese always contains poisonous substances, produced by the action of germs. These are not ordinarily present in sufficient quantity to render their presence apparent by seriously toxic symptoms; but the fact that the cheese-eater may at any time swallow unawares a fatal dose of cheese poison, or a dose of sufficient size to imperil his life and entail great suffering, is evidenced by the frequency with which cases of cheese poisoning are reported. The symptoms are vomiting and great pain in the stomach, violent purging, lasting from twelve to forty-eight hours, great prostration, and in some cases syncope.

Drs. Schaeffer and Bondzynski showed many years ago that cheese made from cooked milk does not mature. Adametz has shown that the ad-

dition of thymol and other germicides to milk in making cheese prevents the maturing of the cheese.

Teeth Decay

Q. **What is the significance of dental decay?**

A. The significance of dental caries, which is coming to be well-nigh universal among the people of the United States, is little appreciated. Premature decay of the teeth indicates feebleness of constitution in the individual, and when this condition becomes so general as to be a race characteristic, it is a handwriting on the wall, pointing unmistakably to race extinction.

Dentists may repair the teeth mechanically, but they cannot mend the weak constitution to which the decay is due. Strong bodies (and teeth) are made by excluding flesh meats, condiments, sloppy foods, cane sugar and indigestibles, by daily outdoor exercise, the daily cold bath, and other methods of health culture.

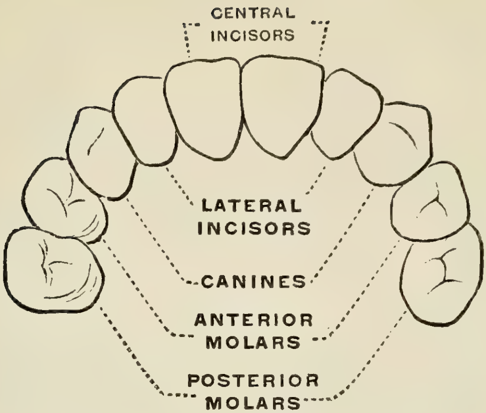
Early decay of the teeth means a short life and an increasing low vital resistance. There must be a rigid self-examination, the result of which should be a putting away of every practice which tends to weaken the vitality, and the cultivation of health by every known means.

Care of the Teeth

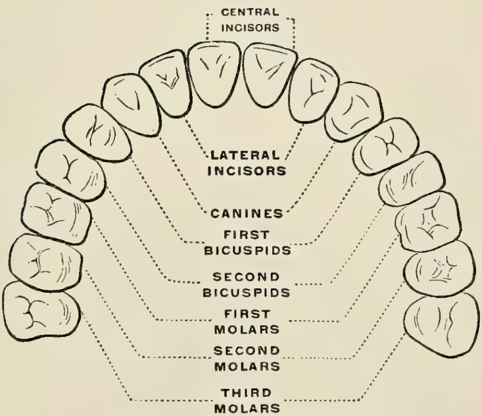
Q. **Is the tooth brush essential to the care of the teeth?**

A. It is important to keep the mouth clean, but whether the toothbrush is essential or even beneficial for this purpose is still a question. There are eminent authorities who condemn the

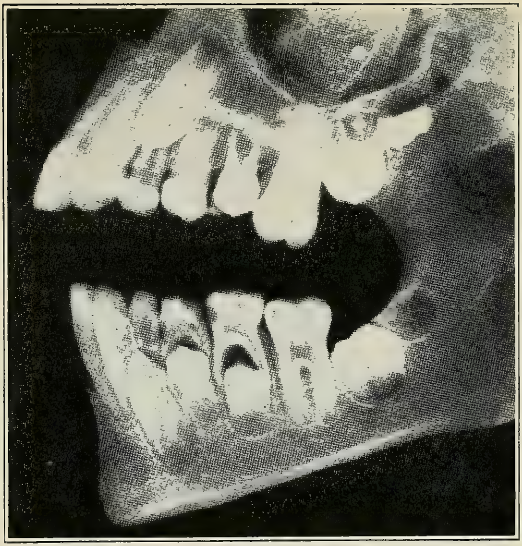
toothbrush, first, because the bristles tear the gums and drive the particles of decomposing food into the narrow spaces between the teeth. Second, the toothbrush itself after being used a few times, becomes thoroughly infected and there seems to be no very simple and efficient method of disinfecting it. Certainly ordinary rinsing is not sufficient. The average toothbrush is in a very filthy state. Dr. Head, an eminent dental authority has called the attention of the profession to the filthy condition of the toothbrush as it is ordinarily used. Prof. Miller, another dental authority, has shown that the brushing action of the bristles upon the surfaces of the teeth, produces an injurious effect and causes wasting about the necks of the teeth. Prof. Hutchinson reports the results of research workers who have investigated the question of the toothbrush and their conclusion is that it is a dangerous instrument. The truth seems to be that the eating of fruit, especially at the close of a meal, is the best method of cleaning the teeth. Chewing a stalk of celery, an apple, or fresh pineapple are very efficient methods of cleansing the teeth. For polishing the teeth, the best means that can be employed is the Hygos polishing paper (see The New Dental Hygiene, page 175) . The spaces between the teeth should be cleaned by floss silk. The toothbrush is, of course, convenient and it will probably continue in use notwithstanding the recently disclosed facts concerning its disadvantages.



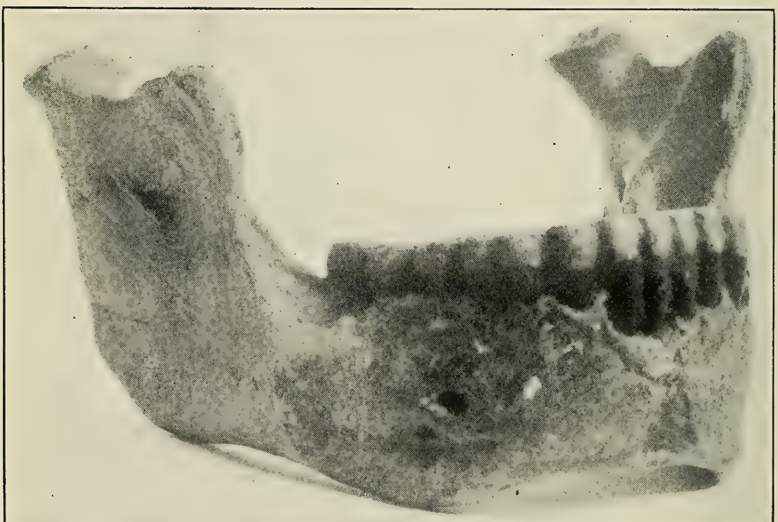
The Temporary (Milk) Teeth



The Permanent Teeth



X-Ray of Teeth, Showing Permanent Teeth Crowding Out the Milk Teeth



The Heidelberg Jaw
(See page 96)

Wisdom Teeth

Q. **I am twenty-four years of age, but have no wisdom teeth.**

A. The third molars are disappearing. This is one of the evidences of general race decay. There is probably no room in your jaw for the teeth to develop. However, it is possible that the wisdom teeth may appear quite late in life.

Do Sweets Injure Teeth?

Q. **Are sweet substances injurious to the teeth, even though the teeth are cleansed immediately afterward?**

A. No. The injurious effects of sugar upon the teeth are the result of indigestion. When sugar is largely used, the system is deprived of lime, and so all the bony structures of the body are damaged.

Pyorrhea

Q. **What is the cause and the proper treatment of pyorrhea?**

A. Modern bacteriological and clinical studies have shown that pyorrhea, or ulceration of the gums, is a diseased condition of much greater significance than was formerly supposed. This disease, if not checked, not only leads to loss of the teeth, but still worse effects are produced in other parts of the body than the mouth. The germs and germ poisons developed are likely to find their way into remote parts of the body and give rise to such grave conditions as disease of the joints, which may lead even to serious deformities manifested in various forms of rheu-

matic disease, neuritis, and possibly even diseases of the heart and blood vessels.

The disease starts with a mechanical injury of the gums, due sometimes perhaps to improper use of the tooth brush. It is kept up by pus-forming bacteria, whch grow luxuriantly in the mouth at the edges of the gums, which they gradually eat away, working steadily deeper into the jaw, laying bare the root of the tooth more and more, until finally the tooth becomes loosened and falls out for lack of support. In the meantime, the injury resulting from the growth of these pus-forming germs is not confined to the mouth, but may extend to other parts. Being swallowed with the food, they cause gastritis and ulcer of the stomach and duodenum, and, working further down into the intestines, produce chronic enteritis and especially colitis. They get into the circulation and find their way into the joints, where they set up inflammations. They work their way into the ears and cause deafness. Wandering out from the alimentary tract, they invade the liver and pancreas, and cause disease of the gall bladder, gall stones, inflammation of the bile passages, pancreatitis, and the diabetes which results from this disease, to say nothing of the headaches, neuralgias, neuritis, neurasthenias, and multitudinous other functional nerve troubles which result from the absorption of the virulent poisons produced by the streptococci and other pus-forming organisms always found in the mouth of a person suffering from pyorrhea.

The freshly secreted saliva formed from healthy blood is the best of all mouth antiseptics,

but the saliva keeps the mouth in a healthy condition only when it is produced in abundance and formed from pure blood. Healthy blood is rich in substances which combat germs and germ poisons. Saliva formed from such blood is also rich in these substances, and when the teeth are bathed in a constant flow of this natural antiseptic, germs cannot form colonies upon the teeth nor pyorrhea develop.

When meats are freely used, the fragments of undigested meat find their way into the colon and there undergo putrefaction. The products of these germ poisons are absorbed into the blood in large quantities. The result is a great exhaustion and depression of the germ-resisting powers of the blood. When the blood is thus changed, the saliva formed by the blood undergoes the same change. It is no longer a good mouth antiseptic, and ceases to protect the teeth against the encroachments of pus-forming and other germs which are constantly finding their way into it from the air, the food, and by other means. The resistance of the gums is likewise lessened, and so the defense of the mouth against the growth of pernicious bacteria is broken down.

A meat diet deprives the body of lime. The daily lime requirement of the body is about fifteen grains, or a quarter of a dram. The food must contain this amount of lime to replace the loss. Flesh meats are almost wholly lacking in lime.

When meat is eaten, fragments of undigested meat undergo the same putrefactive changes in the colon which take place in meat when left

in a warm, moist place. The same thing happens in the mouth. Small fibers of the flesh are caught between the teeth and furnish the very best sort of food for the pus-forming germs which prey upon the teeth and the gums, causing pyorrhea and teeth decay.

As furnished by the butcher, meat is always in a state of more or less advanced decomposition, as the process of decay begins in the body of an animal within a few hours after its death.

It is difficult, indeed, to imagine any more effective method of producing a condition of pyorrhea than that which is constantly in operation in the mouth of a person who is an habitual meat-eater.

Teeth of East Indians

Q. **Is it true that the Hindu people have remarkably sound teeth?**

A. Dr. Egbert, who has made a careful study of the teeth of the natives of India, in an article in the *British Journal of Dental Science,* states that although he has examined the teeth of hundreds of Hindu natives, he has never found a single case of malformation, and that the teeth of the Hindu people are remarkably free from decay. They rarely lose their teeth from caries. He attributed this remarkable immunity from a disease which is coming to be almost universal among Americans and English people, in part to the cleanly habits of the Hindus, who carefully cleanse their teeth with a primitive but efficient brush every day, in obedience to the laws of their religion.

He also calls attention to another and still

more important factor, the absence of flesh food from the dietary of the Hindu.

Dr. Benjamin Rush noted more than a century ago that the Indians rarely suffered from the teeth or from dental decay.

Organic Lime and Dental Decay

Q. **Why is organic lime essential for preventing decay of the teeth?**

A. The enamel of the teeth, which protects these bony structures, is composed of lime. When the enamel is broken the less resistant structures beneath are exposed to toxic bacteria. The normal saliva contains a sufficient amount of lime to protect the teeth from the attacks of acids. Professor Rickert, of the Dental Department of the University of Michigan, has shown by laboratory experiments that decay of the teeth is accompanied by a diminution in the lime content of the saliva. It has also been observed in England that decay of the teeth has increased just in proportion to the increased use of fine flour bread which is lacking in lime.

The New Dental Hygiene

Q. **What is the best method of caring for the teeth?**

A. Eat dry hard food and chew long and well.

Eat freely of greens and other foods rich in lime.

Make the bowels move three or four times daily by means of bran or agar and laxative foods, with mineral oil.

Keep the mouth and teeth clean but do not

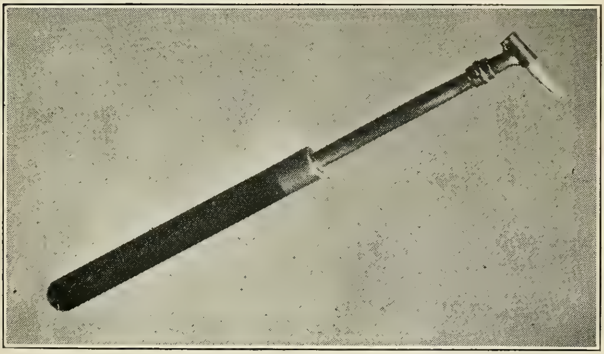
depend upon the tooth brush. Here is a better way:

Rub the teeth with a bit of dry cotton held by a proper holder. Scrub all the surfaces inside as well as outside. Don't neglect a single tooth. After going over all the teeth several times with the dry cotton, throw it away and with a new bit of cotton dipped in water, wash the teeth, and rinse the mouth thoroughly.

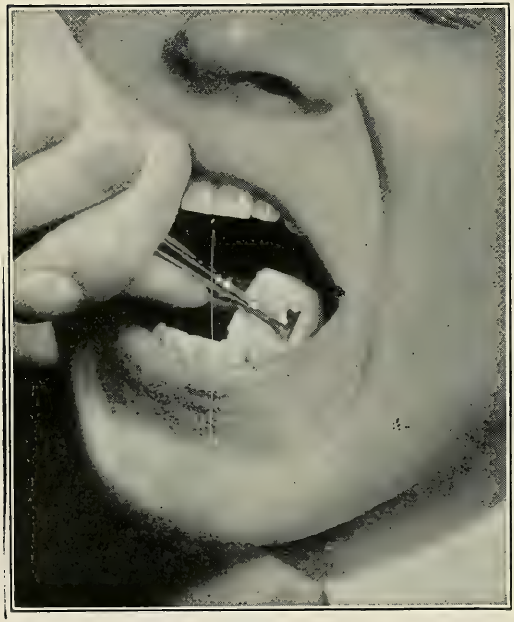
Now you are ready for the real thing, which is polishing the teeth, something which cannot be done either with cotton or with the brush. Wood fiber is the one suitable substance for this purpose. It should be used in two forms: (1) a paper prepared from wood pulp; and (2) a polishing stick of orange wood.

A piece of soft wood pulp paper, ten inches by three inches in size, is folded many times until it forms a compact mass a quarter of an inch thick, an inch long and half an inch wide. This is firmly fixed in the porte-polisher and vigorously applied with vertical and horizontal movements to both the outer and inner dental surfaces until every tooth has been gone over several times. The corners of the paper are useful for working into the spaces between the teeth. Considerable pressure should be used. As the polishing continues, the paper is gradually moistened into a pulpy mass which, by firm pressure against the teeth, molds itself to the shape of the teeth and works into the narrow spaces between them, as shown by the impression of the teeth left upon the moist paper mass after it has been pressed firmly against them.

Hygos Tooth Polisher with Paper



Hygos Polisher with Wood Point



Using Hygos Tooth Polisher

In a surprisingly short time, the surface of the teeth will be found to be so finely polished that when rubbed with the finger, a high-pitched sound is heard identical with that made when the moist finger is rubbed against the window pane.

The efficiency of this paper pulp as a polishing substance is shown by the fact that the stain left by a disclosing solution is very quickly and completely removed by its use. The disclosing solution is very useful as a means of rendering conspicuous "films" and particles of food which may have accumulated upon and about the teeth.

When the teeth have been much neglected, the polishing stick must be used. After every use, the stick must be boiled. Most persons may employ the polishing stick with advantage once a week, at least. By means of the polishing stick, the narrow spaces between the teeth and just below the edge of the gum and the inner surfaces may be kept free from tartar and other accumulations, thus insuring against decay. The ordinary straight polishing stick may be used for the front teeth and the small molars, but for the back teeth and the inner surfaces, a small "point" of orange wood especially prepared for the purpose and applied by means of the porte-polisher, are necessary.

The accompanying cut shows the Hygos holder which is so made that it may be used for both the paper pad and wood "points."

Any suitable polishing powder may be used with both the paper and the polishing stick, and are useful in removing stains and "films."

Wood pulp paper is especially valuable for polishing the teeth because it stimulates the circulation in the gums. Polishing with the wood pulp paper is, in fact, a most efficient method of applying massage to the gums, and not only stimulates the circulation but cleanses in a thorough manner the suppurating surfaces when pyorrhea is present.

The above simple methods when thoroughly and perseveringly applied, will not only arrest and prevent decay of the teeth but will in a few weeks cure pyorrhea when not too far advanced. Indeed, cases are reported in which methods essentially the same as those above described have been used for the cure of pyorrhea so far advanced that the teeth were much loosened and the condition regarded by able dentists as wholly incurable.

Crowned and Bridged Teeth

Q. **Is there any connection between crowned or bridged teeth and such disorders as rheumatism and neuritis?**

A. In recent years it has been found that bridge-work is often the cause of injury through the development of focal infection from abscess formation at the roots of the teeth. Many dental authorities hesitate to recommend bridge-work on this account. The extra strain brought upon the teeth to which the bridge is attached in time injures the teeth and gives rise to infection. When the bridge is attached to dead teeth this is especially likely to occur.

An eminent Eastern professor asserts that "there is no greater menace to health today than

crowned and bridged teeth, to say nothing of imperfectly filled and dead teeth, and of pyorrhea alveolaris. Furthermore, infection of the tonsils and the sinuses adjacent to the nose must never be overlooked. If such infection has not caused symptoms, it will to so, and its eradication is the only safety.

No dentist should devitalize, or attempt to fill the roots of a devitalized tooth, which is to be preserved, without the aid of Roentgenograms: every case of pyorrhea alveolaris, every suspicious root, and occassionally all crowned and bridged teeth should be subjected to the scrutiny offered by the Roentgen-ray."

Mouth Infection

Q. **Are infections of the teeth, gums, tonsils and other structures in the mouth a common cause of disease?**

A. Yes, without doubt. An eminent professor in the Yale University medical school sums up the known facts on this subject as follows:

1. Most unexpected tolerance to pyorrhea alveolaris and to teeth infection is found.

2. Chronic invalidism may be caused by mouth infections.

3. The blood pressure may be raised or lowered by mouth infections.

4. The thyroid gland is frequently enlarged, and may hypersecrete or hyposecrete, in these infections.

5. Serious disturbances of the blood, heart, kidneys, intestines and joints are frequent from mouth infections.

6. Glycosuria can be, and perhaps true diabetes mellitus may be caused by mouth infections.

7. Serious distant focal infections may occur from mouth infection.

8. Serious brain and nerve disturbances, as well as neuritis, may occur from mouth infection.

9. Ulcer of the stomach, pyelitis, appendicitis and chronic colitis may be caused by pyorrhea alveolaris and mouth infection.

10. Pneumonia, especially that which follows influenza, may frequently be caused by pneumococcio long carried in the patient's mouth.

11. No treatment of these conditions will be of any avail until the mouth is made clean.

12. Stock or autogenous vaccines are not very promising as to their therapeutic value, but in obstinate cases they should be tried. Therefore, it is generally well to grow a culture from the infection in the mouths of these patients, that autogenous vaccines may be made and used, if desired.

13. One should be very careful not to promise a cure of a distant condition, although that condition was caused by the mouth infection. However, many brilliant cures are caused by surgical eradication of infected areas. The patient should always be told that the surgical removal of the infected area in the mouth does not remove the germ localized in distant parts of the body, nor does it immediately cure an inflammation caused by these germs in a distant part, neither will it restore degenerated

tissue; but it will remove the primary source of infection.

14. It should be urged that any fresh lesion of the mucous membranes of the mouth is a source of danger, much as is a lesion of the skin. The efficiency of the integument in warding off disease germs has long been recognized. It should be admitted that fresh cuts, abrasions, and blistering of the mucous membrane of the mouth with iodin, or other strong escharotics, offer the opportunity for the absorption of germs that may be freshly received into the mouth, and more especially of germs already in the mouth.

Lessons in other parts of the body, as the appendix or the gall-bladder may produce similar effects.

Brain Work and Dyspepsia

Q. **Is it true that literary men and other brain workers are especially subject to indigestion?**

A. The habits of the average literary man are such as naturally lead to indigestion, insomnia, neurasthenia, and general physical deterioration. Few of those who cultivate literature escape the evil effects of an unnatural sedentary life.

Dr. Gould, some years ago, gathered together a mass of interesting facts which present a graphic picture of the excruciating suffering of men whose literary labors have contributed greatly to human progress. According to this indefatigable *litterateur*—

"DeQuincey was utterly prostrated with 'nerv-

ous' horror,' 'deranged liver,' 'incapacity for food,' and lost 'all power of thinkng at all.'

Carlyle had 'nameless struggles and miseries,' dyspepsia like a rat gnawing,' moods 'tragical, gloomy, weary, dispirited, sick'; he was 'all palpitating, fluttered with sleeplessness'; these attacks were long-continued, and terribly spoilt a great part of his life.

"Darwin spoke of 'not one whole day without my stomach greatly disordered, and most days great prostration of health,' wretched digestive organs,' life a burden,' and for the greatest part of his life he was obliged to remain much in retirement owing to such troubles.

"Huxley endured great depression and want of energy, and described himself as 'in for life-long dyspepsia.' After being 'worried almost to death,' at last, by greatly reducing his diet, and cutting off alcohol and tobacco, freeing himself, as he expresses it, from 'gross intemperance,' he became as vigorous as ever he was in his life.

"Robert Browning suffered at one time from 'a state of nervous prostration and physical apathy.'

"Herbert Spencer was perforce an invalid during a large part of his life, painfully sensitive and subject to disorders of the digestion and nerves."

Diet of Brain Workers

Q. **Do persons engaged in hard brain labor require an extra amount of food?**

A. The interesting and exhaustive researches that have been carried on by Benedict and others,

have shown that the amount of food required by a person doing the very hardest kind of brain work is scarcely more than that required by the person who simply loafs, doing nothing at all. It appears from these experiments, and those of Rubner and other European investigators that the amount of food required depends first upon the amount of heat lost, since two-thirds to three-fourths of all the food eaten is consumed in maintaining bodily heat, and second upon the amount of muscular work performed. The actual amount of food required by a sedentary person engaged in mental work, during ten hours a day is not more than two-thirds the amount needed by a person engaged for the same length of time in vigorous muscular work.

The Bismuth Meal

Q. **What is the bismuth meal and what information is obtained by it?**

A. The bismuth meal consists of a small quantity of food to which bismuth or some similar substance has been added. After the food is swallowed, observations are made by the x-ray and the time is noted when the stomach is emptied, also when the bismuth meal appears at different points along the alimentary canal. By the careful study of normal persons, the time required for the movement of the food mass from one part of the alimentary canal to another has been definitely determined; also the length of time which it is normally retained in the stomach, the cecum and other parts of the intestine. In certain forms of disease, the movement of the food along the canal is accelerated,

but more often it is delayed in some parts, especially in the stomach and the colon.

By means of x-ray examinations of the stomach, it is now possible to determine the exact shape, size and location of this organ and to actually follow its activities with the eye, thus making clear many conditions which were formerly highly problematical. It is also possible to determine the location of ulcers, cancers or other growths, "kinks," adhesions, and various malformations.

Meat Diet Injurious in Tuberculosis

Q. **Is meat diet beneficial in tuberculosis?**

A. Richet proposed and strongly advocated a diet of raw meat for tuberculosis patients. A few years ago a sanatorium was opened in Belgium for the special purpose of treating patients by this method. At the end of three months the enterprise was abandoned, the promoters declaring that "there was no efficacy whatever in the method." The writer has had frequent occasion to note the pernicious effects of a long-continued flesh dietary. In one case of renal disease the arterial degeneration associated with the malady was evidently encouraged, and the patient died of apoplexy after pursuing the diet for three years, although still under fifty years of age.

Meat Broths and Typhoid Fever

Q. **Why are meat broths objectionable in typhoid fever?**

A. In relation to the diet of typhoid fever patients, it is interesting to note that the discovery that flesh foods of all sorts are objec-

tionable in this disease is not by any means a modern discovery. Doctor J. B. Nichols contributed to the *Medical Record* some years ago an article in which extremely interesting historical facts were compiled. It seems that in the eighteenth century flesh foods of all sorts were excluded from the dietary of fever patients, the belief being that the use of animal foods increased the fever and encouraged intestinal putrefaction. Eggs, broths, beef tea, meat extracts, as well as meats, were rigidly excluded, the diet being exclusively vegetable in character.

Broussais regarded broths as especially harmful, and allowed only mucilaginous or acidulated drinks.

Milk is especially objectionable in typhoid fever on account of the danger of the formation and accumulation in indigestible curds. The great deficiency of digestive secretions in this disease, and especially the lack of ability to digest proteins, favors the accumulation of undigested curds in the bowel and an increase of intestinal putrefaction in consequence.

Vegetable Diet and Uric Acid

Q. **What foods other than flesh and tea are most likely to produce uric acid in the system?**

A. Asparagus, peas, beans, and lentils contain small amounts of uric acid, but the amount contained in these vegetable foods is very small compared with that found in meats, and it is very doubtful whether the moderate use of these articles can do any harm.

Diet in Cases of Kidney or Bladder Stone

Q. **What is the proper diet for a person suffering from a stone in the kidney or bladder?**

A. Kidney stones as well as bladder stones are mostly due to excess of uric acid in the system.

Hindhede of Copenhagen has shown that the urine of a person living upon a diet largely composed of potatoes is capable of dissolving forty or fifty times as much uric acid as that of a person living on a mixed diet, while the urine of persons using meat frequently will dissolve no uric acid at all. This observation suggests that a person suffering from stone in the kidney or bladder should adopt a dietary consisting chiefly of fruits and vegetables, substituting potatoes for bread and other cereals. Care should be taken to keep the bowels open. They should move at least three times a day. Water should be taken freely; two or three quarts daily. For radical relief a surgical operation is necessary. After such an operation the dietary suggested should be carefully followed to prevent a return of the calculi.

Grape Cure

Q. **Is the grape cure beneficial?**

A. The so-called "grape cure" is much practised in Switzerland where it has been in use for many centuries. It was recommended by Dujardin-Beaumetz and others for cases of dyspepsia, especially when accompanied by constipation, and in gout it is very useful.

It is also valuable in chronic diarrhea of dys-

enteric origin. Chronic cystitis is benefited by the alkaline carbonates developed by the vegetable acids of the fruit, but in such cases, care must be taken that the grapes are ripe. Cardiac affections are relieved by the laxative and diuretic action, while almost all patients are benefited by the fresh air, exercise, and early rising which the rules of the "cure" involve. Grapes grown on volcanic soil are said to have a more markedly stimulant and diuretic action than others. As to the amount, Dujardin-Beaumetz recommends patients to take as much as they possibly can without exciting disgust. The duration of the cure is from one to three months.

Fruit Diet

Q. **Why is a fruit diet said to be antitoxic?**

A. More than ten years ago Kitasato and Van Ermengen demonstrated experimentally that citric acid and other fruit acids are possessed of very active germicidal properties. The typhoid bacillus and also the bacillus of cholera were destroyed by a one-half per cent solution of citric acid. Malic acid, the acid of the apple, was found equally efficient.

The idea of using fruit juices in cases of gastrointestinal autointoxication is by no means new. A Doctor Dwight more than a century ago reported cases of sick headache successfully treated by giving the patient a glassful of apple cider before each meal. The character of the food certainly makes a very marked difference in cases of this sort. For example, in the case of a meal consisting of scraped beef prepared and cooked in the usual way bacter-

iological examinations made of the stomach fluid showed twenty-five thousand bacteria per drop, although after a sterile meal no bacteria at all were found. In the same case a test meal of cheese gave seventy million colonies to the ounce of stomach fluid. These observations led the writer to adopt more than a dozen years ago in the treatment of all cases of gastrointestinal affection an antiseptic (Dujardin-Beaumetz), or rather an antitoxic or atoxic dietary, from which meat, eggs, and in some cases even milk, are wholly excluded.

Diet During Pregnancy

Q. What is the best diet to be followed during pregnancy?

A. The diet of an expectant mother should not differ essentially from that of any other person in ordinary health except that special pains should be taken to keep the bowels moving at least three times a day and so regulate the diet that the stools will not have a putrid odor. Neglect of this precaution has caused serious and even fatal complications.

Meat should be avoided. Milk should be used freely, also fruits and fresh vegetables. Greens should be used freely and daily, together with wheat bran at each meal or agar. Paraffin oil should be taken in sufficient quantity to secure three bowel movements daily.

Diet in Bright's Disease

Q. Why is a low protein diet advisable in Bright's disease?

A. Von Noorden, one of the most eminent medical authorities, has called attention to

the fact, also pointed out by Senator and other physiologists, that in cases of Bright's disease the protein in the diet should be very greatly reduced. The reason for this is that in all cases of Bright's disease the ability of the kidneys to remove the protein wastes from the body is greatly diminished. A diet low in protein, as von Noorden says, "puts less strain on the diseased organs." This eminent authority adds: "I must not conclude without reminding my readers that it is the theory of many physicians that neuphritic patients should be given a diet poor in proteins (Senator, F. Hirschfield, Albu, and others). No doubt this is true for acute neuphritis and for the acute relapses of chronic neuphritis, as I have emphasized elsewhere. For two years I have been of the opinion that in acute and dangerous cases none should be given in the food. I have given nothing but sugar-water and fruit-juice for from three to eight days at a stretch. It was my impression that this form of treatment was very useful, and that uremic symptoms were obviated, or if already present, were removed."

Von Noorden adds further, "I am of the opinion that the protein intake should be reduced to the lowest possible limit in acute nephritis."

Such a diet requires the elimination of meats of all sorts and in most cases eggs must also be forbidden.

We might also add that even a milk diet is often too rich in protein. It is highly important that when the inflammation is at the worst in the acute stages of the disease, nothing should be

given but sugar-water (preferably malt sugar) to the amount of five or six ounces of sugar daily together with strained rice gruel to which a little cream or butter is added.

Fever Diet

Q. **What is the best diet for a fever patient?**

A. This is a most important question. The diet generally recommended is milk. In many fevers, especially typhoid fever, it would hardly be possible to make a worse selection. Meat broths, beef juice, etc., are still less wholesome, but a milk diet is without doubt in large degree responsible for the diarrhea, the coated tongue, and many of the worst symptoms characteristic of this disease.

If milk is taken at all in fever, it should be in the form of buttermilk or kumyss; but it is better to discard milk and to administer antitoxic foods. For the first three or five days a diet of fruit juices will be amply sufficient. The patient may be allowed to take all he wants of natural fruit juices, such as apple juice, grape juice, orange juice, etc. The addition of cane sugar is objectionable. Honey and the sweet syrup obtained by stewing raisins in a small amount of water are far better and more wholesome than cane sugar for sweetening purposes.

After the first day or two a rather liberal diet may be adopted, but it must consist chiefly of fruits and vegetables. Cereals may be used in moderation.

The best cereals are oatmeal and cornmeal cooked not more than ten minutes. The addition

of bran does no harm and aids bowel action. Fats must be used very sparingly on account of their effect upon gastric secretion.

The vegetables must be given in the form of purees, and if nuts, either in the form of purees or fruit pieces. The addition of malt sugar to acid fruits, as also to fruit juices, is highly advantageous.

The Antitoxic Diet

Q. **Please give the Antitoxic Diet List used at the Battle Creek Sanitarium.**

A. The following is a copy of diet lists in use at the Sanitarium:

Antitoxic Dietary No. 1

GRUELS

Cereals	Taro

CEREAL FOODS

Oatmeal	Granola
Cornmeal	Browned rice
Cream of Wheat	Brose
Toasted wheat flakes	Rusk
Toasted corn flakes	Breakfast toast
Granose biscuit	Dry toast
Toasted rice flakes	Gluten Gruel
Rice biscuit	Infant food
Shredded wheat biscuit	Popped corn

MALTED FOODS

Malted Milk	Malted Nuts

Meltose

SALADS

Vegetable	Fruit

Broths and Soups without Cream

Vegetables without Cream or Milk

Fresh Fruits and Fruit Juices

Apples (should be mellow)	Raspberry juice
Bananas (should be very ripe)	Blackberry juice
Melons	Apple juice
Grape juice	Fruit sauces

Sterilized butter in small amount

Antitoxic Dietary No. 2

The Same as No. 1 with the Addition of

Buttermilk	Sterilized butter
Yogurt Buttermilk	Soy curd
Cottage cheese	Corn pulp
Whey	Lettuce
Yolks of eggs	Celery

Articles Which Must Always Be Avoided

Meats of all sorts	Tea
Fish, oysters, shellfish	Coffee
Lobsters and crabs	Cocoa
Eggs, except the yolks	Chocolate

Condiments, excepting salt in very small amount; never mustard, pepper, or vinegar.

In very severe cases No. 1 is used, and as the patient recovers, No. 2 is added. The bacteria which produce intestinal autointoxication thrive best in the medium in which animal protein is abundant. They do not thrive well in vegetable protein.

Effects of Excessive Meat Diet

Q. **What are the effects of an excessive meat diet?**

A. Bouchard's investigations long ago demonstrated that flesh foods contain tissue-toxins in large quantities. Bouchard, Roger, Brieger, and a host of others have carefully studied these poisons, and demonstrated their toxic character. Both Boix and Metchnikoff are authority for the statement that these flesh poisons are capable of producing changes in the visceral walls, the liver, spleen, and other structures.

Numerous other facts which have come to light within the past few years point in the same direction, and lead to the conclusion that the free use of flesh food in the dietary of human beings may be, in part at least, responsible for subtle changes in the human organism which lay the foundation for many chronic systemic disorders, the origin of which has been recognized as more or less obscure. The etiology of such maladies as chronic nephritis, hepatic sclerosis, pernicious anemia, chronic intestinal catarrh, various skin disorders, and a multitude of so-called nervous diseases has been by no means clear. For some time back the opinion has been gaining ground among investigators that these maladies are due to the influence of poisons circulating in the blood and exercising a pernicious influence upon special organs because of unusual contact or special susceptibility. In Watson's experiments a rat fed for three weeks upon an exclusive diet of meat and water died from autointoxication with atrophy of the thyroid gland. It must be admitted that

human beings who habitually subject themselves to the influence of the same subtle poisons by the free use of flesh foods must suffer deleterious effects therefrom.

More than this, Chittenden has clearly shown that the average civilized human being habitually eats at least two or three times as much protein as his bodily requirements demand. The excess of protein thus absorbed is all converted into toxic substances, which must enormously overtax the liver, kidneys, and other poison-eliminating structures, besides exposing all the tissues of the body to the deteriorating influence of an excess of toxic substances in the blood. Persons who make free use of meat—a very large class, including most of those who live habitually at hotels and restaurants—indulge in a still greater excess of protein, the amount often rising to five or six times the normal quantity, or even more. The deteriorating influence of such a diet is seen in nervous headaches, mental depression, insomnia, nervous irritability, various forms of rheumatism and gout, neuralgia, neurasthenia, and a multitude of complex forms of ill health difficult to classify because of the interminable mixture of symptoms pointing toward a general vital depression.

When the amount of protein is reduced to normal limits, flesh food is almost of necessity eliminated from the dietary, for the reason that most cereal foods contain an ample proportion of the protein element, while the legumes,—peas, beans, and lentils,—supplemented if necessary by milk and eggs, furnish excess of pro-

tein with which to balance up such foods as potatoes, rice, fruits, and other foodstuffs which are poor in protein.

Diet for the Sedentary

Q. What foods are especially useful for sedentary persons?

A. No one should lead a wholly sedentary life. It is unnatural and disease-producing in spite of any special dietary precautions which may be taken. It may be easily shown, however, that a flesh diet or a high protein diet, that is, a diet consisting largely of meat or eggs, is particularly injurious in persons of sedentary habits. When the body is inactive the amount of oxygen received is less than one-fifth that which is absorbed and circulated by the blood during active exercise. A person who is largely confined indoors and has little opportunity for exercise should not only avoid meats, but should use cereals very sparingly. The diet should consist chiefly of fruits of all sorts, potatoes and other fresh vegetables, including uncooked vegetables such as celery, lettuce, cabbage, cucumbers and tomatoes. Bran should also be freely used to stimulate intestinal activity.

Diet in Cancer

Q. Is there any diet which predisposes to cancer?

A. Recent researches have shown beyond room for doubt that a hearty meat diet produces a predisposition to cancer.

Murphy and Morton showed that when the body is invaded by parasitic organisms, certain

blood cells known as lymphocytes rapidly increase in number and when this occurs the attack is aborted, that is, the enemy is driven off. After an x-ray application every rat inoculated became infected because of the injurious effects of the x-ray upon the white cells of the blood.

Dr. Leuden conducted studies for the purpose of finding the influence of diet upon the body defense. She found that a meat diet greatly increases the amount of cholesterol (a tissue waste) and diminished notably the "lymphoid defense." A vegetable diet, on the other hand, had just the opposite effect, decreasing the cholesterol and increasing the defense.

The results of this highly interesting and laborious research are in perfect accord with the observations of Williams of England and Bulkley of New York. Williams has shown that cancer is a disease of meat-eating animals and meat-eating men, and that meat-abstainers, animals and men, are practically free from cancer.

Keith, the famous English anatomist, calls attention to the fact that meat-eating has increased enormously in England within the last fifty years, and that cancer has increased at almost the same rate.

Those who wish to fortify themselves against cancer should therefore discard meats of all sorts. The fleshless diet promotes purity of blood by suppressing autointoxication. An anti-toxic diet, that is, a diet which discourages the development of putrefactive poisons in the intestine, is specially to be commended as a means of combating cancer. Such a dietary should be adopted by all persons suffering from

cancer, and also by those who are so unfortunate as to have a cancer heredity.

An antitoxic dietary excludes not only flesh foods, but tea, coffee, alcohol, tobacco, vinegar, mustard, pepper, peppersauce and other condiments, as well as all other toxic and irritating substances.

A liberal use should be made of fresh fruits and vegetables because of the large amount of potash which they contain. Potatoes, carrots, raw cabbage, lettuce and cucumbers are especially to be commended. Buttermilk, sourmilk, yogurt milk and such special ferments as yogurt should be used freely.

A Farinaceous Diet

Q. **In what way does an excess of starchy food injure the health?**

A. It is almost impossible for a person to suffer injury from the use of an excess of starchy food.

The evils that are attributed to an excess of starch are not really due to this cause, but to the lack of other needed elements. Starch itself is harmless and does no injury. When the diet consists exclusively of polished rice or fine flour bread, vitamines are lacking. The evil effects often attributed to a farinaceous diet, such as rheumatism, neuralgia, anemia, etc., are due to other causes, especially to lack of vitamines and constipation.

Roughage in Foods

Q. **Why is roughage or bulky indigestible material necessary for health?**

A. Magnus-Levy states that herbivorous ani-

mals, like the rabbit, die when fed on food which leaves no residue. Adult human beings are not so constructed that they can exist on a diet which leaves no residue, or even so little residue as pure milk does; it is only during their childhood that they can live on nothing but milk for long periods. On residue-free diets the peristalsis is sluggish, and this causes disturbances that are only subjective at first but later cause objective upset of the digestion. The importance of these food residues is emphasized in the term "intestinal scourers" that has been given them. The carnivora, too, do not dispense with them willingly; just as they devour bones, so do the graminivorous birds swallow sand, feathers, and the like.

Bran

Q. Is bran taken with flakes irritating to the bowels?

A. No. Wet bran is emollient. Bran acts upon the bowels by titillation. Bran is a "scouring" food, but does not cause irritation. It is most efficient when used with paraffin oil in some form. It should be used freely, a tablespoonful or more at each meal.

Corn Bread

Q. Is corn bread good for one who suffers with constipation?

A. Corn bread is wholesome food when taken in connection with other foods, but it does not encourage intestinal activity.

Constipating Foods

Q. What foods have a tendency to produce inactivity of the bowels?

A. Liquid foods which contain little indigestible residue are anti-laxative, or constipating. Rice, fine wheat flour in bread and similar preparations, cornstarch, Iceland moss, gelatin, white of egg, boiled milk, are constipating. The same is also true of oatmeal mush when long cooked. Gruels and similar preparations are highly constipating in character.

Diabetic Foods

Q. What foods are best for persons suffering from diabetes?

A. The popular idea that persons suffering from diabetes should live chiefly upon meats is a serious error. Almost all the eminent authorities are agreed that meat, especially underdone meat, is detrimental in diabetes, and that patients do much better on a diet in which animal proteins are replaced by vegetable proteins, such as gluten bread and other gluten preparations and nuts of various sorts. Von Noorden arranges the various proteins in the following order as regards their suitability for use by diabetics: (1) Vegetable proteins, (2) eggs, (3) milk, (4) meats.

The following varieties of nuts are especially wholesome.

Butternuts	Filberts
Pignolias	Almonds
Brazilnuts	Walnuts
Black walnuts	Beechnuts
Hickory nuts	Pistachios
Pecans	Cocoanuts

The diabetic should make his bill of fare consist chiefly of fresh vegetables of which the best are the following:

- Lettuce
- Spinach
- Sauerkraut
- String beans
- Celery
- Asparagus
- Cucumbers
- Brussels sprouts
- Endive
- Dandelion greens
- Swiss chard
- Sea kale
- Turnip tops
- Cauliflower
- Tomatoes
- Egg plant
- Beet greens
- Water cress
- Cabbage
- Radishes
- Kohl-rabi
- Broccoli
- Vegetable marrow

The following vegetables may be used sparingly under the supervision of a physician:

- Potatoes
- Baked beans
- Shell beans
- Green corn

Of fruits the following may be used:

- Ripe olives
- Grape fruit
- Lemons
- Oranges
- Cranberries
- Apples
- Pears
- Apricots
- Cherries
- Raspberries
- Strawberries
- Blackberries
- Gooseberries
- Peaches
- Pineapple
- Plums
- Bananas
- Blueberries
- Currants
- Huckleberries

The best substitutes for meats, which should be avoided, are protose, nuttolene, gluten biscuit, soy bean biscuit, almond cream, soy bean curd.

Other foods which may be used under the supervision of a physician are, oat meal, eggs, milk, buttermilk and rice.

Diet in Anemia

Q. **What should be the proper diet of an anemic person?**

A. An anemic person should eat a great deal of fresh vegetables, especially green things like lettuce and cucumbers or those things containing a great deal of iron. He does not need to eat meat. Indeed, meat is the very last thing such a person should eat. This condition in many cases is due to poisoning by colon germs, which are derived from meat. According to Sherman and other authorities, the iron of vegetables is much more easily assimilated than the iron of blood and meat.

Diet in Catarrh

Q. **What is the proper diet for a person afflicted with long-standing catarrh?**

A. Nasal catarrh and catarrh in general are the result of low resistance. The blood and tissues have lost to some degree their natural power of resistance against the infection of bacteria. Intestinal autointoxication is the most common cause, and no method of cure can be successful without the adoption of an antitoxic, laxative diet, and a thorough building up of the general health by the outdoor life, and all other hygienic means. It is especially important that the bowels should be made to move three or four times a day, thoroughly, so that undigested food rem-

nants shall not have time for putrefaction. Copious water drinking is important. Take three to six pints of water daily. Out of door life and open air sleeping are important as well as regulation of diet. A person suffering with catarrh should live the "simple life."

Balanced Diet

Q. **What is a balanced ration?**

A. That diet which is carefully adapted to the individual's work, both in its proportion of the various food elements (proteins, fats and carbohydrates) and in quantity. The normal diet for a man of medium size doing sedentary work is two thousand calories, the proteins, fats and carbohydrates being in the ratio of 1:3:6. That is, one-tenth of the day's intake should be protein, one-third the remainder should be fats, and the rest carbohydrates. The following table shows approximately the total number of calories, with the proportion of the various food elements for men and women of different heights:

MEN

Height	Calories or Food Units			
in In.	Proteins	Fats	Carbohydrates	Total
61	197	591	1,182	1,970
62	200	600	1,200	2,000
63	204	612	1,224	2,040
64	210	630	1,260	2,100
65	215	645	1,290	2,150
66	221	663	1,326	2,210
67	228	684	1,368	2,280
68	236	708	1,416	2,360
69	243	729	1,458	2,430
70	251	753	1,506	2,510
71	260	780	1,560	2,600
72	269	807	1,614	2,690

Height in In.	Proteins	Calories or Food Units Fats	Carbohydrates	Total
73	278	834	1,668	2,780
74	288	864	1,728	2,880
75	300	900	1,800	3,000

WOMEN

Height in In.	Proteins	Fats	Carbohydrates	Total
59	179	537	1,074	1,790
60	183	549	1,098	1,830
61	186	558	1,116	1,860
62	191	573	1,146	1,910
63	197	591	1,182	1,970
64	201	603	1,206	2,010
65	209	627	1,254	2,090
66	215	645	1,290	2,150
67	221	663	1,326	2,210
68	227	681	1,362	2,270
69	232	696	1,392	2,320
70	239	717	1,434	2,390

One engaged in hard muscular labor should increase the above amount by one-half, increasing at the same time the proportion of fats and carbohydrates, particularly the latter. Where the individual's work is extremely sedentary, calling for constant sitting at a desk, the total ration will in most cases be cut down to a point indicated by the individual's appetite. The amount which this calls for varies with the seasons, more food being consumed during the winter months than in the summer. The amount of food required depends primarily upon the amount of skin surface, as food is principally needed to maintain animal heat, which is chiefly lost through the skin. A child has a much larger skin surface in proportion to its weight than has a larger person. For example, a child weighing ten pounds has a skin surface of three square feet, while a man weighing 180 pounds, or eighteen times as much, has a skin area of

about 21 square feet, only seven times greater. The child of ten pounds requires, then, about one-seventh as much food as a man weighing 180 pounds, instead of only one-eighteenth as much.

Persons who are thin in flesh and who have good digestion may be able to appropriate ten to twenty per cent more of fats or of carbohydrates than a person in ordinary health.

The total amount of food should rarely exceed 2,400 food units or calories, and the amount may often be diminished with profit, under medical direction, to 1,500 or 1,200, or even less for a time.

In cases of obesity the food intake is usually reduced about one-third. A two-thirds ration may be safely followed for some time.

The amount of energy required for the body varies, of course, with the season, with the weather, and with the amount and kind of work done. Hard, physical work and exposure to low temperature demand the largest food supply.

It should be stated, however, that a person whose occupation is indoors in an atmosphere the temperature of which is practically the same as that of average summer temperature, does not require more food in the winter than in the summer season, since his loss of heat is no greater. A person who perspires very freely, however, either when at work during the hot season out of doors or in a heated room at any season, requires practically as much food as one doing the same amount of work in a cold atmosphere, because of the large amount of heat carried off from the body by the evaporation of perspiration from the skin.

In estimating the number of calories required by persons of different weights and skin surfaces, the weight in pounds was multiplied by the factor 4.25, and the surface, or skin area, by 80, the sum of these two products representing the number of calories required to make good the losses of energy expended in vital work through the dissipation of heat from the body by radiation, conduction, and evaporation of moisture from the skin and from the cutaneous and respiratory surfaces.

The Daily Ration

Q. **How may one estimate the amount of food that he is taking at each meal?**

A. This can be done only by carefully weighing or measuring the foods and consulting a reliable table.

A Saltless Diet in Epilepsy

Q. **Is it true that salt is injurious to epileptics?**

A. Yes, an excess of salt is without doubt among the causes of several serious conditions. It is particularly harmful in pleurisy, in fevers, in Bright's disease, and has been shown to greatly aggravate the symptoms of epilepsy.

The late Dr. Combe, of Switzerland, was one of the first to call attention to the above mentioned fact regarding salt.

He reported very remarkable results in the treatment of epilepsy by discontinuing the use of salt. In actual practice the method has since been found of great value.

Another French physician, Dr. Mirallié, has

more recently made a study of the value of this method, and claims it to be highly valuable.

"Miralliè insists that salt should be discarded absolutely, as also tea, coffee and alcohol. Then the doses of bromids can be materially reduced, and such improvement may then be realized that it amounts to an actual cure. He gives a moderate dose of bromid every day, without interruption. When his patients go thus two or three years without a seizure, he reduces the dose of the bromid, but emphasizes that absolute abstention from salt is the main thing. In his first series of 181 cases, only 83 followed his instructions. At that time he ordered merely restriction of salt. In 12 cases the results were negative; in 18 there was improvement and 53 had no further seizures. Since 1912, 52 of a later series of 133 cases followed instructions, and 31 have had no further seizures and 18 have been much improved; more or less benefit has been realized in all but 3 cases. Of 10 men in one institution, all were improved and 5 apparently cured, as also 9 of the 12 women, all showing marked improvement. The youngest of the clinically cured was 7, the oldest 63 years of age. The seizures in one case had been frequent from the age of 7 to 37, but there have been none since this treatment was instituted. The best results were realized in families in which the mother did the cooking, and she was able thus to keep all salt out of the bread, the butter, etc. When this was left to servants, the salt was not banished so rigorously. Full success was realized only in the cases with absolute abstention from salt, tea, coffee and alcohol. Sugar, pepper, vinegar and

lemon juice were allowed freely. The benefit was prompter and more pronounced in persons who had previously used much salt. The other symptoms of epilepsy were not modified so early as the actual seizures. The diet, except for salt and stimulants, can be varied and liberal, but must be served entirely without salt. The failures were always in the wealthy homes."

Cooking Dried Fruit

Q. **How should dried fruit be prepared to make it resemble fresh fruit as closely as possible?**

A. A bulletin sent out by the French Ministry of Agriculture suggests the following recipe for preparing for table use dried apples, peaches and pears: "Wash the fruit, then place in a large vessel. Pour over the fruit boiling water—three parts of boiling water to one part of fruit—and set the pot aside, leaving the fruit steeping for a whole day or a day and a night if necessary. The fruit will swell and become fresh and scented. If any of the water remains over, it may be reboiled with a little sugar, thereby making a rich syrup, which can be poured over the fruit when the latter is served. Do not cook dried fruit in any other way than this. If you boil it too much the fruit will become hard and lose all its original taste and freshness."

The Jerusalem Artichoke

Q. **Is the Jerusalem artichoke a wholesome food?**

A. Yes. It is a native American plant and has a very considerable food value and ought to

be more largely used than it is at present. It is especially valuable as a food for diabetics.

According to the Bulletin of the Torrey Botanical Club of 1895, it produces many edible tubers, sometimes two inches in diameter, in our day mostly used for the feeding of cattle, horses and pigs, but which were precious to the Indians on account of their hardiness and prolificacy, retaining possession of the soil for many years. These tubers were mentioned by Champlain in 1603 and brought to France by Lescarbot who, in 1612, describes them as being "as big as small turnips, excellent to eat, with the taste of artichoke but more agreeable, and multiplying in a wonderful way." As the plant is native of the valleys of the Ohio and Mississippi and does not reach any part of Canada, it is evident that the Canadian and New England Indians who planted it must have obtained it from the tribes further south and west, so that we may infer a rather large area of cultivation. The Jerusalem artichoke is, so far, the only contribution of North America, exclusive of Mexico, to the vegetable garden of the world, and it can be said to be an aboriginal contribution. Strange to note, it is now much more cultivated in the Old World than on this continent."

Vitamines

Q. **What are vitamines?**

A. Vitamines, the most recently discovered of food elements, are subtle substances which are absolutely essential to natural development and good nutrition. Vitamines do not actually enter into the composition of the body, but do in some way not yet fully understood keep in

efficient operation the life processes in ways which are absolutely essential to our physical well being.

Recent studies of vitamines by the experts of the U. S. Public Health Service indicate that there are several different sorts of vitamines, which are found in different proportions in different substances. The absence of certain vitamines gives rise to beri-beri, a disease which destroys the lives of many thousands annually in oriental countries where polished rice is the staple food, and is not unknown in this country.

Beri-beri is very common among the fishermen of Labrador and Newfoundland who live largely on fine flour bread and tea. A diet of tea and toast is an open invitation to beri-beri.

Scurvy is another disease due to absence of certain special vitamines which probably are different from those which cause beri-beri. Rickets in children and pellagra in adults also probably belong to this same class of deficiency diseases.

Foods Which Prevent Beri-Beri	**Foods Which Cause Beri-Beri**
Beans	Polished rice
Peas	Fine wheat flour
Egg yolk	Hominy
Fresh milk	Corn flour
Whole grains	Corn and rice flakes
Rice	All cereals deprived of bran
Barley	Corn and wheat starch
Wheat	Pork
Rye	Lard
Rice bran	Sterilized (boiled) milk
Fresh meat	Sterilized meat (canned meat and fish)
Wheat bran	Canned vegetables
Yeast	

Cabbage, turnips, carrots, cucumbers, lettuce, greens and similar vegetables are poor in beriberi preventing vitamines. It is a remarkable fact, however, that these same foods, together with fresh fruits are very rich in the vitamines which prevent scurvy.

Foods Which Prevent Scurvy	**Foods Which Are Poor in Scurvy Preventing Vitamines**
Fresh milk (Not boiled or pasteurized)	Sterilized milk
Fresh vegetables	Canned meats
Fresh fruits	Canned vegetables
Fruit juices (Unboiled)	Dried vegetables
	Dried fruits
	Dried cereals
	Lard

Infants and young children often suffer from deficiency diseases and hence the above facts are of utmost value and importance in relation to the feeding of children as well as adults.

Later observations have shown that certain vitamines are fat soluble and others water soluble. Both are needed for growth and healthy development. Children fed on pasteurized or sterilized milk should be fed daily one or two ounces of orange juice or potato soup seasoned with a little butter.

It is believed that lack of vitamines may be the cause of many chronic ailments such as neuralgia, neuritis, rheumatism and general decline.

Antiscorbutic Vitamin

Q. **What foods contain the vitamin which prevents scurvy?**

A. According to the report of the War Food Committee of the Royal Society of Great Britain, "the vitamin which will prevent scurvy is con-

tained in a number of fresh foods: in largest amount in oranges, lemons, and fresh green vegetables; in considerable amount in roots and tubers, such as swedes, potatoes, etc.; and in small quantities in fresh meat and milk. It is deficient in all dried and preserved foods. It is destroyed by prolonged heating, such as takes place during stewing. Thus, potatoes in stews would be devoid of vitamin, but if boiled rapidly will still contain some quantity. Alkalies rapidly destroy antiscorbutic properties. Soda should therefore not be added to the water in which vegetables are soaked or boiled."

Q. **Since vitamines have not been isolated and their composition determined, how is their effect upon animals known?**

A. Mendel sums up the experiments which demonstrate the influence of vitamines as follows:

"An animal is placed upon a diet consisting of isolated proteins, carbohydrates, fats and inorganic salts the traditional mixture of nutrients which the physiology of our teachers has led us to expect to be adequate for the body's needs. Nutritive failure and decline will inevitably ensue, attended by a variety of symptoms, perhaps those seen in beri-beri. An exceedingly small dose of brewers' yeast or a chemical fraction prepared therefrom, or a small allowance of a vegetable like the tomato, spinach of carrot, or an addition of milk or of any of a large variety of naturally occurring foods to the dietary, will bring a restitution of health with a speed and completeness that is little short of marvelous. We are face to face in such instances with the

nutrition-promoting potency of something which cannot be expressed in terms of the hitherto recognized nutrients. A ration compounded of washed skeletal muscle (beefsteak), carbohydrate, fat and salts leads to analogous nutritive failure; whereas, the substitution of liver or kidney tissue for the meat, in an otherwise unaltered diet, ensures uninterrupted well-being. In terms of the current hypothesis we have become accustomed to say that the yeast, the vegetables, the milk, liver and kidney contain an essential food factor or vitamine.

"Again, if in an otherwise adequate dietary the sole source of fat is represented by lard or one of the familiar vegetable oils, nutritive disaster will ensue sooner or later. During the period of pronounced malnutrition serious eye disease may arise as one of the intercurrent symptoms. The introduction of a small amount of milk fat, liver fat (as in cod-liver oil) or the oil of some of the vegetables, as Osborne and I have lately demonstrated, brings about an almost magical restitution of health. Here evidently we are concerned with the presence in certain of the fats or fat-like mixtures of another potent property distinct from the vitamine already described. To these illustrations, so striking that they are not easily forgotten by one who has witnessed the surprising remedial transformations induced by seemingly insignificant quantities of certain food products, may be added the presumably distinct antiscorbutic properties of certain natural foods."

Effect of Vitamines on Appetite

Q. **Do vitamines influence appetite?**

A. Without doubt. Carlson has shown that "one of the conspicuous manifestations of a dietary regimen deficient in certain types of vitamines is a diminished food intake. The feeding of vitamine-containing products almost always results in an improved appetite, if one may judge this by the resulting ingestion of increased amounts of the same ration which was refused on the vitamine-free regimen. Precisely what the decisive relationships here are—whether improved appetite induced by the vitamine leads to better food intake and hence better nutrition or whether nutrition improved by the potent food factor results in better appetite—can scarcely be decided at the present time. At any rate the possible bearing of vitamines on the problem of appetite and alimentary well-being should not be over-looked by those who are interested in the physiology and pathology of the gastroenteric tract."

The Sunflower

Q. **Is the sunflower a wholesome food?**

A. Yes. It is curious that one of our native American plants, the sunflower, should receive so little attention as a source of food. Its seeds are wholesome and very palatable. They contain nearly fifty per cent of a fine oil equal to olive oil for table purposes. Now that this interesting plant has come back to us from Manchuria and Russia so much improved by foreign travel, we ought to give it more attention. The following excerpts from an interesting article in the

Scientific American, by Mr. C. D. Mell, give us much useful information regarding this little known food plant:

"The sunflower originally came from Central America, and it is believed that it was cultivated by the Indians in Yucatan, Mexico, and Peru long before the discovery of America. It was brought from Mexico to Spain in the Sixteenth Century and from there it soon spread over all the countries of Europe and the greater part of Asia. It appears that its best development is attained in Western and Southern Russia. While this plant was introduced from Mexico into the United States and now grows spontaneously almost everywhere in this country, it was not until recent years that a cultivated variety was introduced. There are a number of good varieties now under cultivation, but the black-seeded variety is doubtless the most productive kind. There is a well-defined Manchurian variety; another kind is now grown successfully in Spain. There is also a small-seeded variety growing in America. The Russian black-seeded variety is highly prized on account of its high yield of seed per acre. It is said that these seeds yield between 50 and 60 per cent of the high grade oil.

"The best results in sunflower cultivation in America are obtained from a well-tilled soil with not too much clay in its composition; it should be well plowed in the autumn and harrowed in the spring. The seed should be planted in April or May. Various methods of planting and spacing are being recommended in different countries. It is best to plant in rows running

north and south, the seeds to be placed nine inches apart in rows thirty inches apart. If the seeds are planted by means of a carefully regulated drill such as is used in planting corn, not over five pounds of seed are required to plant an acre. It is of interest to note here that the plant assimilates a large quantity of potash and, therefore, it must not be planted in the same soil the second year or a failure crop will result."

Cheese

Q. **Is cheese a wholesome article of food?**

A. There are various kinds of cheese, some of which are entirely wholesome while others are unfit to enter the human stomach.

Cottage cheese is free from injurious bacteria. Other kinds of cheese when first made are equally wholesome, but in the process of ripening cheese, properties are required which are not desirable. It is impossible to make cheese from sterilized milk. That is, if the milk is treated in such a way as to destroy the bacterial moulds and germs which it contains it would not undergo the changes which take place in the process of ripening, and would not become cheese.

When first made, the curd is very tough. The toughness of the curd only disappears under the action of moulds, yeasts, and various putrefactive and other germs which are ordinarily found in milk. In other words, the process of ripening cheese is a process of decay.

In the making of cheese, various moulds and germs are often added. For example, the famous Camembert cheese is made by adding to the curd powdered crackers on which a thick

layer of green mould has been permitted to grow. It is this green mould scattered throughout the cheese which gives it its peculiar color and flavor.

It is true that healthy gastric juice is able to disinfect cheese as well as putrescent meat. The disinfecting properties in human gastric juice are, however, nothing like so great as has been observed in some other animals. For example, the gastric juice of the dog and of the turkey buzzard possesses disinfectant properties of the most extraordinary sort.

Very putrid meat fed to a dog has been found an hour later when the dog was killed and his stomach opened, absolutely free from putrefactive change, but there are many persons whose stomachs have ceased to produce gastric juice possessing these properties. This is true of all persons who have hypo-acidity (hypo-pepsia or achylia.)

Cheese eaten by such persons inoculates the stomach with moulds and various bacteria and encourages the growth of these putrefactive and other organisms in the intestine.

We get enough of these undesirable elements from the filthy gleanings from the cow barn, the pig pen, the chicken coop and other sources of filth which are served to us in dairy milk, without supplementing this undesirable intake of scavenger germs by a concentrated culture of the same unfriendly organisms in the form of cheese.

Many of the objections which apply to the use of flesh meat do not apply to the use of cheese, but it must be admitted for the reasons

above given, that cheese cannot be regarded as a superior food product. In the absence of better food, cheese is not to be despised, and as a substitute for meat, it might even be recommended, at least the decent forms of cheese.

Of course, Limberger, Brie, Roquefort and similar rotten milk products are fit only to be served to a turkey buzzard. But it must be evident to the intelligent reader that in the face of the above facts, cottage cheese or fresh cream cheese must be in every way preferable to the ordinary forms of cheese.

Epidemics of cheese poisoning occur, due to the fact that favorable conditions have happened to lead to a development of an unusual number of certain putrefactive bacteria, and the consequent production of such a quantity of bacterial poison produces toxic and even dangerous symptoms.

Experiments made many years ago seem to indicate very clearly that the bacteria that produces cheese poisoning are practically always present in cheese. An eminent chemist many years ago discovered a method by which the presence of poison in cheese could be detected. When he made an application of this test, however, he found to his consternation that the poison was present in practically all cheese offered for sale. The chemist accordingly suppressed his test, it being evident that its general introduction would lead to the destruction of the entire cheese business.

If the bacterial and toxic properties found in cheese were discovered in canned beans, peas,

or any other canned fruit or vegetables by any pure food department in the country, the contaminated products would be at once ordered destroyed. Can anybody show any reason why moulds, putrefactive germs and yeasts of various kinds are more wholesome when introduced into the body in the form of cheese than when introduced with peas, beans or any other foodstuff?

Brown Rice

Q. **What is brown rice?**

A. Brown rice is whole rice, that is, rice from which the bran or outer covering has not been removed. It is what is generally, though incorrectly, designated as unpolished rice. Unpolished rice is rice from which the bran has been removed, but which has not been polished by treatment with glucose and talc. An exclusive diet of polished rice will in time produce a disease known as beri-beri. This may be prevented by the use of brown rice, which contains the newly discovered vitamines, the absence of which is a cause of beri-beri.

Food Value of Rice

Q. **What is the value of rice as a food?**

A. Rice is one of the most digestible of all foods.

Boiled rice digests in one hour, whereas white bread requires three and one-half hours for digestion. Rice is highly nutritious. It is however, lacking in cellulose and in vitamines. When employed in connection with milk and other foods, however, especially beans or peas or other legumes, it is a very valuable food.

Half of the world's population, among them its most hardy toilers, subsist mainly on rice. The Chinese coolie, living by the most arduous manual labor, is fed on rice. The burly porters of Smyrna and Constantinople, men who carry incredible loads, work on a diet of figs, sour milk, and rice. Those picturesque jinrikisha boys trotting along the streets and roads of Japan, pulling their queer vehicles at the rate of six miles per hour, get their energy from this same grain.

Rice Diet

Q. **Can one thrive on an exclusive rice diet after being accustomed to an ordinary American diet?**

A. A person cannot maintain health for any considerable length of time on a diet consisting exclusively of ordinary rice. The natives of India have fresh vegetables as well as rice and some fats along with it. They make large use of a kind of legume which is equivalent to our peas or beans. Peas, beans, fresh vegetables and rice go well with fruit. One can live well on a diet of fruit and rice, with the addition of a little fat.

Polished Rice

Q. **How can one determine whether or not rice is polished or not?**

A. By its appearance. It is not the polishing that does the harm, however, The injury results from the removal of the bran. Rice with the bran unremoved is known as "brown rice;" it is darker in color than polished rice and lacks its polished appearance.

Browned Rice

Q. **Is browned rice preferable for a weak stomach?**

A. The browning of rice unquestionably increases its digestibility and wholesomeness. The custom of browning or parching rice as well as other cereals is common among the Mexican Indians, the natives of India, and other rice-eating people.

Is Rice Constipating

Q. **Is rice a constipating food?**

A. An exclusive diet of rice will likely produce an inactive state of the bowels, as rice is so entirely digestible that practically no residue will be left to act as a mechanical stimulus to intestinal activity. When rice is used largely, lettuce or some other bulky food should be used in connection with it.

Wild Rice

Q. **What is wild rice?**

A. Wild rice is a variety of rice which grows in the shallow lakes of Minnesota and Wisconsin and Southern Canada. It is a species of the zizania aquatica, and is one of the most nourishing cereals which this country produces. Unfortunately it is exceedingly difficult to propagate and all attempts thus far to enlarge its production have failed. The small supply obtainable is gathered by the Indians, certain tribes of which formerly depended very largely upon the wild rice for their sustenance.

Wheat Albumen

Q. **After cooking wheat for some time there appears a gluey substance in the water. Should this substance be poured off and new water poured on?**

A. No, indeed. The soluble matters of the wheat kernel consist of albumen, sugar and dextrine, and are highly nourishing.

Rye Bread

Q. **Is rye bread wholesome?**

A. Rye bread is most certainly a wholesome article of food. It is to most people less palatable than wheat bread, but it contains essentially the same elements as wheat bread and because of the large amount of cellulose which it contains produces a useful laxative effect.

Bread Without Yeast

Q. **By what process can bread be raised without the use of yeast?**

A. Most primitive people make bread without yeast. The introduction of the use of yeast in bread making has doubtless been a great injury to the human family. There are several methods of making excellent bread without yeast. Briefly stated, the following are a few.

(1) The Mexican Indians make a very toothsome bread which they call *tortillas,* by first hulling corn by soaking it in hot limewater, and then grinding the moist corn into a paste, finally making the paste into cakes resembling griddle cakes by compression between the hands. The cakes are baked on tins placed over hot coals. When well baked, tortillas are crisp, sweet and

wholesome. (2) The Arabs make bread of flour by a simple process of grinding the whole wheat after washing and drying in the sun, then making into a stiff dough with water and baking in thin cakes on a hot tin or flat stone. (3) The people of the South make beaten biscuit by making a stiff dough with flour and water and a little salt, then beating for a long time with hammer or mallet and baking in small thick cakes. (4) A very toothsome bread can be made by beating flour and water together to a batter a little thicker than pancake batter and baking in cast-iron gem pans. The pans should be very hot before the batter is put in. A quick oven and some practice are required for good results. A variation of this method which gives most excellent results is to add white of egg to the batter, stirring it in quickly just before putting in the pans.

Inferiority of White Bread

Q. **Authorities state that the protein in whole wheat bread is only .2 per cent more than in white bread, and that it contains 3.4 per cent less carbohydrates than white bread. Is not fine flour bread then preferable?**

A. Neither the amount of protein nor the amount of carbohydrates in a flour is a true measure of its value as a food. One of the most important elements of cereal foods are the salts that this class of foods contain, which are of great value to the body in maintaining the strength and vitality of the bones . These salts, of which lime constitutes the largest share, are for the most part combined with phosphoric

acid. They are also highly necessary for the nutrition of the body. The whole wheat contains four grains of lime, besides the accompanying phosphoric acid, to the pound, whereas white bread contains only one grain to the pound. In addition, it should be remembered that the cellulose contained in the whole wheat (or rather the whole meal, for "whole wheat" flour does not really represent the whole wheat) is also of great value as an aid to normal intestinal activity. It should be remembered that whole wheat bread does not represent the entire grain. The term whole wheat as commercially used designates a flour from which the coarse bran has been removed, or rather a mixture of flours which contain a certain proportion of middlings. The above remarks apply to graham flour as well as whole wheat.

Whole Wheat

Q. **Does whole wheat, the whole grain, soaked and boiled until perfectly tender, contain everything the human system requires?**

A. No. The wheat grain does not supply the needed elements in proper proportion, as it contains a smaller proportion of fat than is required by an ideal ration.

Mushes

Q. **Why are mushes prepared from cereals injurious?**

A. Cooked cereals and mushes are not to be altogether condemned. The chief objection is that being soft they are likely to be swallowed without proper mastication. This objection may

be removed, however, by taking care to chew the food thoroughly or at least to retain it in the mouth long enough to secure proper mixture of saliva.

In the case of persons who suffer from hyperacidity chewing may be omitted with advantage. Another objection to the use of mushes as ordinarily prepared is that long cooking renders the starch so easily digestible that it is all completely digested and absorbed in the small intestine so that only a portion reaches the colon. This encourages putrefaction in the colon and leads to constipation. The old Scotch method of preparing oat meal is interesting. Hot water was poured upon the meal, which was stirred until thickened and then served at once. An excellent plan is to stir meal, either oat meal or corn meal into boiling water until the mixture "sets."

The mush is then ready to serve immediately. Cereals are made more wholesome by the addition of one-third or one-fourth their bulk of bran.

Barley

Q. **Is coarse barley inferior to pearl barley?**

A. No. The whole barley grain, like the whole wheat grain, is much more nutritious than any preparation which removes a part of the kernel.

Toasted Bread—Zwieback

Q. **Is toasted bread more wholesome than untoasted?**

A. Toasted bread contains no more nutrient material than untoasted bread, but the toasting completes the cooking, which in case of ordinary baker's bread is far from complete, and so facilitates the digestive process.

Dry toast or zwieback is preferable to ordinary bread because it is hard and dry so it requires more thorough mastication, which not only aids digestion of the bread, but encourages the secretion of gastric juice and so aids in digestion of other foodstuffs.

Home Prepared Bran

Q. **Can bran suitable for use be prepared at home?**

A. Bran may be as easily prepared at home as any other part of the grain. It may be cooked by itself as a mush or combined with cereals or with sweet fruits. Equal parts of bran, corn meal and oat meal make a good combination. Bran may be advantageously added to any breakfast cereal in proportion of one or two tablespoonsful for each serving.

Laxative Quality of Bran

Q. **Why is bran laxative?**

A. Bran is unquestionably the best of all laxatives which can be used for an indefinite time without injury. Bran is laxative for the following reasons:

1. It contains a suitable proportion of cellulose, a substance which the human stomach and

intestines cannot digest. The result of this fact is that when bran is freely used it very greatly increases the residue left after digestion and the absorption of the digested products. Such foodstuffs as white bread, milk, meat, sugar, syrup, lard, butter, soups and broths are practically all digested and absorbed, leaving behind no residue.

But the bowel requires a considerable amount of residue to stimulate it to activity. There must be sufficient bulk to stretch the intestine, otherwise it will not be stimulated to a normal degree of activity. The intestine is not highly endowed with sensibility like the skin. Its walls are chiefly made up of muscle fibers. It possesses the muscle sense in a high degree and this is stimulated only by the stretching of the muscle, hence the bulk of the intestinal contents must be sufficient to actually distend the gut to such a degree that the muscle is slightly stretched, and this will stimulate the muscle to contract.

It is for this reason that gas accumulations in the intestine produce colic. It is not the distention of the intestine that causes the pain, but the strong contraction of the bowel which the distention provokes. This is the reason for the griping pains which accompany colic. The gripe is simply a strong contraction wave passing along the intestine. The amount of bran required to cause the bowel to act will depend upon the degree to which the intestine has become diseased by abuse.

The amount of cellulose found in ordinary natural foodstuffs from which nothing has been removed by the mechanical processes of the mill or the kitchen, is sufficient to furnish the neces-

sary amount of bulk for producing normal intestinal activity.

When the bowel has been long abused, however, it is more difficult to stimulate it to activity and a larger amount of bulk is required. It is necessary in most cases of chronic constipation to add to the ordinary bill of fare a considerable amount of bran, as much in some cases as two well-rounded dessert spoonfuls, and this must be taken at every meal to insure good results.

2. The mere contact of flakes of bran with the mucous membrane of the intestine has a stimulating effect. The bran does not irritate, it merely titilates or tickles. When bran is taken into the mouth, even dry bran, it does not give rise to irritation, that is, it does not wound the tongue or the gums or cause them to bleed, but involuntarily the tongue and cheek muscles keep up a constant activity until every particle of bran has been removed. These movements are quite involuntary. They go on automatically without the exercise of volition.

The same thing occurs in the stomach and intestines. The mucous membrane will not tolerate the presence even of minute foreign bodies. Everything must be moved along. The intestinal tract must be clear. Nothing must be left lying about by the wayside. The intestine acts incessantly until every minute particle of its contents has been passed on into the colon. The same thing happens in the colon. Contact of solid material or semi-solid material keeps the intestine busy in an effort to move it along.

When the bulk is sufficient to distend the bowel, vigorous peristaltic waves are set up

which sweep the bowel contents along so swiftly that the movement cannot be followed by the eye in observations made with the x-ray. But no irritation is produced; that is, the mucous surface is not lacerated or abraided by contact with the particles of bran. The idea that bran is irritating originated with the millers. This theory was hatched and has been vigorously promulgated in the interest of the manufacturers of fine bolted flour. Bran in its ordinary dried condition might well be imagined capable of producing irritation but bran in this condition is never found in the alimentary canal. Before it enters the stomach, even before it enters the mouth, bran is moistened and is usually mixed with other moist foodstuffs. Wet bran is no more capable of producing irritation than wet paper, in fact there is no better emollient than a bran poultice.

3. Pawlow showed in his wonderful experiments upon dogs that bulk, that is, distention of the intestine, is necessary to excite the intestine to produce secretion. This important fact has generally been overlooked in connection with the recommendation of bran. The distention of the intestine by the bulky cellulose causes it to pour the mucus and other fluids necessary to keep it moist and to lubricate it in its passage along the bowel.

4. Some experimental evidence has been offered which seems to show that bran contains a substance, probably a hormone, which stimulates the intestine to activity. It is probable that no other substance known possesses so many and so valuable laxative properties as does bran. If

every citizen in the United States could be induced to take at each meal one large tablespoonful of bran it is probable that half the doctors and most of the patent medicine vendors would in less than three months' time be looking for some other more profitable occupation.

Continued Use of Bran

Q. **Can one use sterilized bran indefinitely without any harm?**

A. Sterilized or cooked bran may be used for an indefinite time without injury; in fact most people could with great benefit add one or two tablespoonfuls of bran to each daily meal with great profit. Bran supplies elements which are needed to complete the ordinary bill-of-fare and should be found on every table at every meal.

Bran Bread Not Injurious

Q. **Is it true, as stated by Mr. Hoover, that graham bread was the cause of sickness and death in Belgium?**

A. No. Mr. Hoover was misinformed. It appears that sickness followed the use of graham bread made from American wheat, but it was not shown that the bran which the bread contained was the cause of the sickness. On the contrary, it appears that the wheat from which the graham bread was made was unfit for food. This was shown by the testimony of Mr. Moench, which appeared in a New York newspaper bearing date of March 8, 1918. Said Mr. Moench:

"I personally sold 17,000 bushels of frozen, musty, immature wheat unfit for chicken feed

which found its way into Belgium." This wheat was shipped to Belgium.

Mr. Moench also mentioned other and larger lots of spoiled wheat which was manufactured into flour and sent to Belgium. There is no evidence that anyone was ever made ill by the use of graham or bran bread.

Popcorn

Q. **What is the food value and digestibility of popcorn?**

A. Popcorn is readily digestible if not saturated with fat of some sort, especially if thoroughly masticated. Its nutritive value is about one hundred calories to the ounce.

Cereal Diet

Q. **I have read that cereals may be injurious. Would you advise one to discontinue the use of graham gems, bran, and zwieback?**

A. The use of breads and other cereals cannot be regarded as an unwholesome practice unless these articles are made the principal part of the bill-of-fare. When one uses cereals a liberal supply of fruits and of fresh vegetables should also be used to neutralize the excess of acids in the cereals. Cereals may constitute part of the dietary to advantage, but should not be the principal part. A complete and safe diet must include beside seeds, both roots and green leaves to supply lime, iron, various salts and vitamines. To make sure of good nutrition add a pint of milk.

Forest Foods

Q. **Could life be sustained by the natural food products obtainable in an American forest?**

A. In the summer and fall it would certainly be possible to obtain an abundance of food fit for human consumption in a wide range of American forests. It might even be possible to dispense with fire if not needed for protection against cold, since with few exceptions, nuts and fruits contain litttle or no starch, which is the only element of vegetable food which requires or is improved by cooking.

We quote as follows from an article sent out by the U. S. Department of Agriculture:

"Aside from the numerous edible mushrooms, roots, fruits of shrubs and smaller plants, the trees of our forests afford a large variety of edibles which are highly prized by woods connoisseurs. First in importance, of course, are our native nuts—beech nuts, butternuts, walnuts, chestnuts and chinquapins, hazel nuts and several kinds of hickory nuts, including pecans. The kernels of all of these are not only toothsome but highly nutritious and are used by vegetarians to replace meat. The oil of the beech nut is said to be little inferior to olive oil, while that of butternuts and walnuts was used by some of the Indians for various purposes. The Indians, it is said, also formerly mixed chestnuts with corn meal and made a bread which was baked in corn husks, like tamales. In parts of Europe bread is made from chestnuts alone. The chestnut crop in this country is being reduced each year

by the chestnut-blight disease which in some sections is gradually killing out the trees.

Pines Furnish Edible Seeds

"Several Western pines have seeds which play an important part in the diet of the local Indians. Perhaps the best known of these is the fruit of the nut pine or pinion, which forms the basis for a local industry of some size. Not only is it extensively eaten by local settlers and Indians, but large quantities are shipped to the cities in regions where they grow and the roasted seed is sold on the street. The similar seed of the Parry pine and the larger Digger pine are eagerly sought by the Indians. The latter tree is said to have gained its name from its use as a food by the Digger Indians. The seeds of the longleaf pine are edible and are improved by roasting. Indeed, it may be said that most nuts are more *palatable when roasted* than if eaten raw.

Bread from Acorns

"Acorns are commonly thought to be fit only for feeding hogs, but many kinds of them are either sweet enough to eat or can be made edible from an Indian standpoint and have been used as food, particularly when other foods are scarce. The Indian custom was to pound or grind the acorns up and by treating the pulp with water leach out the tannin, which makes most kinds unfit for eating in their natural state. The resulting flour, which contained considerable starch, was made either into a porridge or baked in small cakes. Indian acorn bread is dark in color and to most of us would not seem palatable.

As a rule the acorns of the various white oaks having less tannin are the ones best suited for food, but Indians also used those of the black oaks, even though they contain much tannin. The acorns of the basket or cow oak, the chinquapin oak, shin or Rocky Mountain oak, live oak, and of several other species, are sweet enough to be eaten like nuts.

"Another nut which is not suited for eating as it grows, but from which a food is said to have been prepared by the Indians, is the *buckeye*. The kernels of these nuts were dried, powdered, and water was filtered through them to leach out the poison which they contain. The resulting paste was either eaten cold or baked. Attempts have been made in Europe to utilize the horsechestnut as food, but it has not come into use.

Useful Wild Fruits

"One of the best known fruits, the foresters say, is the persimmon, which is edible only after it is thoroughly ripe. As this is usually not until late in the fall, it is commonly thought that the fruit must be frost-bitten. If the persimmon is eaten before it is well ripened, the tannic acid which the fruit contains has a strongly astringent effect, which justifies the story of the soldier in the Civil War who said he had eaten green persimmons so as to shrink his stomach up to fit his rations. The paw paw, a fruit akin to the custard apple, is also best when thoroughly ripe. Studies of this fruit and its uses have been made by food experts of the United States Department of Agriculture. The fruit of some species of

haws is eaten or preserved in different parts of the country, while those of several kinds of wild cherries and wild currants have a food value and are used for various purposes. Wild plums are abundant in certain sections and occur in particularly plentiful quantities along the streams in the Eastern and Middle Western States. Beach plums are also used for food purposes.

"Several varieties of wild crab apples make delicious jellies. Some of the largest, which attain the size of small apples, are more or less abundant throughout eastern North Carolina. Elderberries are frequently used for pies and for sauce. Those found in the West are sweeter and have a better flavor than the Eastern varieties.

"The berries of the hackberry, or sugar berry, as it is called in the South, are dry, but have an agreeable taste. Those of the mulberry are sweet and juicy when ripe. The mulberry is valued in some sections for feeding hogs and poultry and some species are occasionally cultivated.

"Many people like the fruit of the shad bush, 'sarvice' berry, or June berry, as it is variously called. In parts of the country this fruit is used to make jelly.

Edible Buds, Flowers and Seed Pods

"The French Canadians are said to use the acid flowers of the redbud, or Judas tree, in salads, while the buds and tender pods are pickled in vinegar. Honey locust pods, often called 'honey shucks,' contain a sweetish, thick, cheese-like pulp which is often eaten. The blossoms

of the common white locust also are sometimes used for making fritters in parts of the United States. Those of the mesquite furnish the Mexicans and Indians with a nutritious food. The Creoles of Louisiana, famous for their cookery, use the young buds of the sassafras as a substitute for okra in thickening soups."

Flowers as Food

Q. **Are flowers ever used as food?**

A. While fruits unquestionably occupy the first place in the natural bill of fare for human beings, other parts of plants, including even flowers are also to be found in the great list of vegetable substances which may be made to contribute to human nutrition. A recent consular report from India tells of the use of the flowers of the mahua tree which are regularly used by more than a million people in the central provinces of India.

"The cream-colored flowers appear from February to April and arrive at maturity about the end of March. Each morning about sunrise the succulent corrolla-tubes fall in great showers to the ground, which has been cleared to receive them. The fall from a single tree continues for from seven to ten days. The flowers are spread out in the sun to dry, their color changing to reddish brown, and their peculiar sweet odor becoming more apparent. Though eaten fresh to a considerable extent, the majority of the crop is dried and cooked with rice or other grains. Mahua is extremely sweet, and not easily digested by persons unaccustomed to eating it. Sugar and molasses are made from it."

Extraordinary Foods

Q. **How did unnatural eating habits originate?**

A. Dr. David Fairchild, of the U. S. Agricultural Department, in answering this question, says:

"How did seaweeds and candied grasshoppers come into use in Japan, and fried rhinoceros hide in Africa, and powdered deer horns in China, and pickled pigs' feet in Germany, and mouldy cheese with skippers in it in England, and snails and frogs' legs in France, and grasshoppers, fried and reduced to a meal, in Aragia, and snakes and lizards among the North American Indians, and the octupus among the Neapolitians, and the wood grubs among the New Zealand Maoris, and larks' tongues and eels fed on the flesh of slaves in Rome, and caviar, the eggs of the Volga sturgeon, among the Russians, and rats and mice and dogs and cats by the Chinese, and human flesh by the Fiji Islanders? Is it reasonable to suppose that these customs were acquired in some mysterious evolutionary way? Is it not highly probable that these foods came into vogue just as we know coffee and tea and the potato and tobacco and chocolate have come to be fashionable today in European and American countries, through the encouragement given those who set the fashion of the day?"

The Carrot

Q. **Does the carrot possess any medicinal virtue?**

A. The carrot possesses some remarkable properties which are not generally understood and hence cannot be appreciated and utilized. Some years ago, the late Professor Metchnikoff made the interesting discovery that the stool of rabbits fed on carrots soon lost their fetor and became free from putrefactive germs. Very curiously, this property of carrots, new to the learned professor, had been long recognized by observing layman. An old English writer speaks very definitely of these properties:

"The chief virtues of carrots lie in the strong antiseptic qualities they possess, which prevent all putrescent changes within the body.

"Carrots boiled sufficiently, and mashed into a pulp, when applied directly to a putrid, indolent sore, will sweeten and heal it. The carrot poultice was first used by Salzer for mitigating the pain and correcting the stench of foul ulcers. Raw scraped carrot is an excellent plaster for chapped nipples. At Vichy, where derangments of the liver and of the biliary digestion are particularly treated, carrots in one or another form are served at every meal, whether in soup, or as a vegetable, and considerable efficacy of cure is attached to them."

The Dandelion

Q. **Has the dandelion any real food value?**

A. Yes. The dandelion is highly valuable as a source of iron, lime and vitamins. It is important that this fact should be made widely known; for few people are aware of the fact that the humble dandelion which grows only too luxuriantly in our lawns and uncultivated fields is a valuable food, though one which is usually allowed to go to waste. Instead of regarding the dandelion as a pest and seeking to exterminate it, we should cultivate it in our gardens and give it a conspicuous place on our bills of fare.

The dandelion affords an unusually rich store of three food essentials in which most of our ordinary foodstuffs are deficient. These are food lime and iron, and that remarkable growth-promoting hormone, the so-called fat-soluble A, a subtle vitamin without which normal growth is impossible and which is notably deficient in meat, cereals, most vegetables, in all foods, in fact, except milk and other dairy products, yolk of egg, and greens. These properties of the dandelion are shared by greenstuffs, but few are so rich in these elements as is this humble dooryard weed. Of food iron, the dandelion contains as much as spinach, while affording fifty per cent more lime. Compared with lettuce it contains four times as much iron and two and a half times as much lime.

Besides the dandelion is a very excellent form of roughage. Its free use is an excellent means of combating constipation.

Turnip Juice

Q. **Is there any substitute for orange juice which may be used when oranges are not obtainable?**

A. A research conducted at the Leister Institute of London has shown that the juice of the Swede turnip is practically equal in value to lemon or orange juice in preventing scurvy. Lime juice has only one-fourth the value of lemon juice. The juice of carrots or beets has only one-tenth the value of orange juice. Tomato juice or purée has also recently been found to possess nearly the same value as orange juice.

These facts are highly important since oranges are not always obtainable and are generally high in price. Everybody can afford turnips. Infants fed on sterilized cow's milk (and no other is safe) should receive daily two to four ounces of orange juice or swede juice. One-fourth dram of dried tomato pulp was found sufficient to protect guinea pigs from scurvy by Givens and McCollum.

Medical Uses of the Apple

Q. **Is the apple of any value as a remedy?**

A. In a volume of curious lore written by a retired English doctor as an entertaining occupation for his declining years, "Herbal Simples," we learn that the apple is much used among the peasantry of Lincolnshire "for the cure of weak or rheumatic eyes. Likewise in the *Hotel des Invalides,* at Paris, an apple poultice is employed for inflamed eyes, the apple being roasted, and its pulp applied over the eyes without any interven-

ing substance. To obviate constipation two or three apples taken at night, whether baked or raw, are admirably efficient. It was said long ago: 'They do easily and speedily pass through the belly, therefore they do mollify the belly,' and for that reason a modern maxim teaches that:

'To eat an apple going to bed
Will make the Doctor beg his bread.'

"About the year 1562 a certain rector of St. Ives, in Cornwall, the Rev. Mr. Attwell, practiced physic with milk and apples so successfully in many diseases, and so spread his reputation, that numerous sufferers came to him from all the neighboring counties."

Brose

Q. **What is "brose," and how should it be cooked?**

A. Brose is the Scotch name for oatmeal porridge. In this country, the term is sometimes used for a mixture of oats, corn and wheat. Brose, as eaten by the Scotch, differs from American oatmeal porridge in the ways in which it is cooked.

Oatmeal is usually spoiled by over-cooking. When long cooked, this cereal becomes mucilaginous and sticky, and this is likely to form hard masses in the colon. On this account it encourages constipation, and for many years has been forbidden by leading European physicians. especially on the continent.

This difficulty is wholly due to over-cooking. When prepared in the ancient Scotch fashion, oatmeal is not only laxitive, but aids in getting

rid of the putrefactive bacteria (bad flora) which are always present in autointoxication. The Scotch method of preparing oatmeal porridge, or "porritch," as the Scotch call it, is to stir up the oatmeal in a pan with a little cold water, then to place the pan upon the stove and pour in boiling water, stirring until it thickens. Prepared in this way oatmeal is not fully cooked. In consequence, some undigested starch is left to find its way into the colon, where it serves as a laxative and a corrective of putrefaction.

"Kale brose" is prepared by the Scotch by using water in which cabbage has been boiled in preparing the oatmeal.

In their military forays over their border in the twelfth and thirteenth centuries, the only food carried by the sturdy Scots was a bag of oatmeal.

At the present time, the staple foods of the Scotch peasant are "brose," "bannocks" (oat cakes), and potatoes served with buttermilk, a thoroughly sufficient and scientific dietary.

Says a popular Scotch writer in defense of the simple regimen of his countrymen, "We defy your wheaten bread, your home-made bread, your bakers' bread, your baps, rolls, scones, muffins, crumpets, and cookies, your Bath buns, and your Sally Lunns, your tea cakes, and slim cakes, your saffron cakes, and griddle cakes, your shortbread, and singing hinnies; we swear by the oat cake, and the parrich, the bannock, and the brose."

The term brose is also applied in America to a mixture of oatmeal, cornmeal and bran.

The Colon Needs Starch

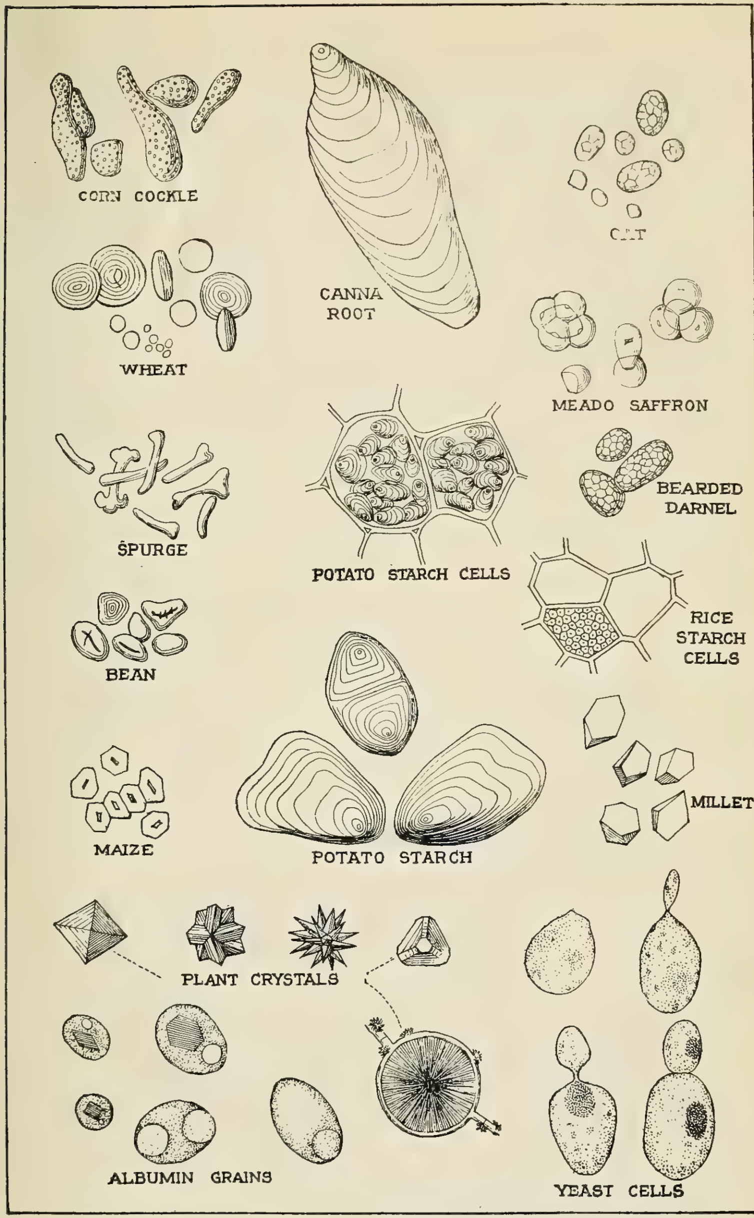
Q. **Since it is difficult to get sugar or starch into the colon before it is absorbed, would it not be of benefit to eat vegetables such as fresh corn slightly underdone?**

A. Yes. Green corn is much more digestible uncooked than cooked, and is also more palatable. Grains in the milk stage are more nearly adapted to the human digestive apparatus than either dried or cooked grains. Besides, the green corn contains vitamines, which are beneficial. The general practice of cooking oatmeal for a long time is productive of constipation. Oatmeal, cracked wheat and some other cereals should be cooked not more than five to ten minutes. Many persons relish these preparations when cooked four to six minutes, or even less time. When eaten in this form, some of the starch finds its way into the colon and there feeds the acid forming bacteria. The greatest benefit is derived from the use of these partially cooked foods when eaten in connection with the *bacillus Bulgaricus* and glycobacteria, the friendly germs which assist in the preservation of a normal condition in the intestine and combat putrefaction.

The Germ of Grains

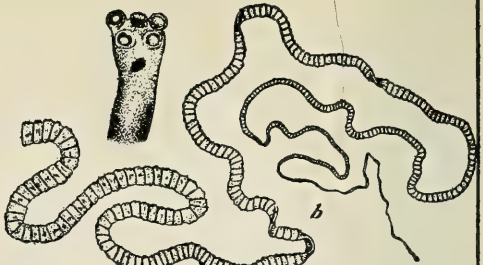
Q. **Is there any special value in the germ of grains? If so, why is it removed in the milling process?**

A. The germ of the grain contains oil and other substances which it is believed impair the quality of flour. Scientific investigation has shown, according to the *American Journal of Physiology,* that the removal of the germ from



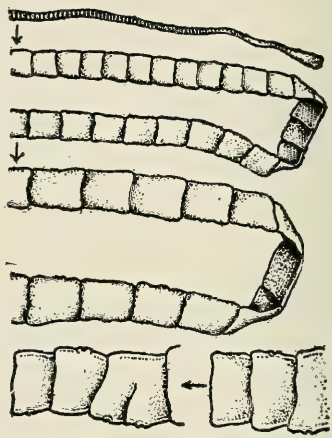
STARCH GRANULES.

A Piece of Meat Infected with Pork-Measles.

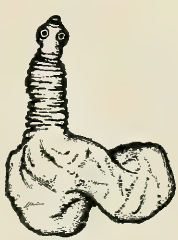


Pork Tapeworm, Head Highly Magnified.

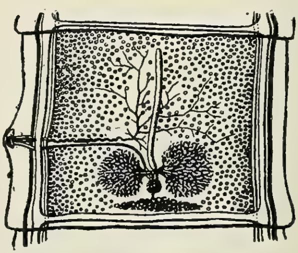
Head of Beef-Measle Tapeworm.



Several Portions of an Adult Beef-Measle Tapeworm.



Pork-Measle Bladder Worm.



Mature Segment of Beef-Measles Tapeworm.

(See page 748)

corn and wheat deprives these grains of essential properties.

Pigeons fed on the degerminated wheat or corn developed polyneuritis—some of them died in twenty-eight days; the others were fed the whole grain and recovered quickly. The onset of the disease came as quickly, even when the corn diet was made more efficient by adding casein, butter fat and a salt mixture.

When the germ is excluded from flour and cornmeal, these foods are deprived of some of their most valuable properties. This is one of the reasons why graham flour and old-fashioned cornmeal are superior to fine flour and the new process cornmeal.

Summer Diet

Q. **Does one require less food in summer than in winter and is less protein needed?**

A. The amount of food required for any season of the year depends more upon the amount of work done than upon the season. One engaged in very hard work in a hot field in mid-summer may require much more food, twice as much perhaps as a person living a sedentary life in the coldest winter weather. The largest amount of food is required by a person engaged in very active work while exposed to a low temperature. Arctic travelers consume enormous quantities of food, mostly fat.

Brain Food

Q. **What foods are best for promoting brain development and supporting brain work?**

A. There is no such thing as brain food; that is, there is no sort of food which especially nourishes the brain. The foods which promote brain action are those which encourage free action of the bowels and maintain the highest degree of blood purity. The proper diet is one which will diminish putrefaction in the intestines and secure three bowel movements daily.

Flesh Building Diet

Q. **What should one eat to build flesh?**

A. Avoid meats, eat an abundance of fruits, rice and other cereals, fresh vegetables, ripe olives or olive oil, and take care that the bowels move two or three times a day. Nuts, sweet butter, cream, rice and other cereals, potatoes, malt sugar, malted nuts, vegetable oils, are excellent fattening foods. Drink an abundance of pure water between meals, morning and night. Live in the open air. Sleep outdoors. Take a cold rub or "salt glow" every morning.

When it is desirable to make a decided gain in weight there is no better means than the milk regimen. Five or six quarts must be taken daily to insure an actual gain. Four quarts are needed to maintain the weight. More must be taken to insure a gain.

Relation of Food to Gain in Weight

Q. **At what rate may the body safely gain in weight?**

A. A very rapid gain in weight is not always desirable. The gain observed may be due to increase of water, fat, or muscle. Fat is increased by an excess of food of any sort, but especially by excess of carbohydrates and fats. Fats are deposited directly, substantially as eaten. For every ounce of carbohydrate retained in the body, three ounces of water are also retained. For every ounce of salt, one hundred to one hundred and twenty ounces of water will be retained. Evidently the disuse of salt is important for persons who desire to lose in weight.

How to Gain Weight

Q. **What measures must one adopt to gain weight?**

A. A good method for putting on flesh which is quite generally applicable is this: For two or three days make the diet consist wholly of fruits and bran. Bran may be taken in various ways, in combination with fruits, as mixed with the fruit juices or in purées. After two or three days this regimen, which will have the effect to increase the activity of the bowels and to change the intestinal flora, a liberal diet may be eaten and will probably be well digested for the reason that the digestive organs improve rapidy under the regimen suggested. The improved appetite renders the taking of an increased quantity of food possible. This increase should amount to twenty-five to fifty per cent. A person who can

take fifty per cent more food daily than he actually requires should gain in weight several pounds a week. In many cases only a small extra amount of food can be digested and assimilated. In such cases the gain in weight will be slower.

Starch, sugar and fats are the best foodstuffs for increasing weight, because the most easily digestible and assimilable, and also because for a given amount of material, starch causes a greater gain than does fat. Fats increase weight ounce for ounce, that is, for each ounce of fat in addition to the full diet, the weight will increase one ounce. In case of starch and sugar, however the weight is increased four times the weight of the food intake, that is, an ounce of starch or sugar should increase the weight four ounces. It is understood in both instances, however, that the fat or carbohydrate taken is in addition to the full dietary, that is, a supply of food sufficient to maintain weight under existing conditions.

Water drinking is also necessary to produce a rapid gain in weight. The process of tissue building involves the fixing of a considerable amount of water of which the body contains a very large percentage. The actual specific gravity of the body is only slightly less than that of water.

Fat Containing Foods

Q. **What foods contain the most fat?**

A. Butter is nearly all fat. Nuts contain a very large amount of fat, 40% to 60%. Cream is about 25% fat.

The avocado or alligator pear contains twenty per cent fat, about the same as the ripe olive, which is also rich in fat. The soy bean contains 15% to 20% fat.

Laxative Properties of Foodstuffs

Q. **Why are some foods more laxative than others?**

A. The properties of foodstuffs which have a laxative influence may be briefly enumerated as follows:

1. Qualities to which flavor or taste are due.
2. Bulk, due to the presence of cellulose, which forms an indigestible residue.
3. Moisture; that is, a necessary amount of liquid taken at meals or between meals, and especially in connection with the indigestible cellulose capable of absorbing and holding moisture in the intestine.
4. Chemical properties that result from the presence of sugars and organic acids in the food, including the sugars formed by the digestion of starch, and the lactic acids formed by the fermentation of sugar in the intestine. Fats are also somewhat laxative.
5. Uncooked vegetable foods are laxative because they furnish to the colon some undigested starch which feeds the friendly germs which in turn produce acids by which the colon is stimulated to action.

Laxative Effects of Meals

Q. **Why do the bowels move more frequently after meals?**

A. Food is the natural laxative; for a healthy colon, a healthy alimentary canal, it is all the laxative that is required. Whenever food is taken into the stomach, peristaltic activity is immediately set up, a peristaltic wave traveling from one end of the alimentary canal to the other.

This explains why there is a natural desire for bowel movement directly after each meal—some of the movements that are set up are transmitted to the intestine and travel its entire length.

Observations made by the x-ray show, for example, that during the hour of the eating of a meal, and immediately afterward, the material in the intestine moves forward more than it does in the four or five hours previous.

Motility Period of Alimentary Canal

Q. **How long time is required for food to make the transit of the digestive tube?**

A. The normal time is probably 8 to 10 hours.

Normally, the food leaves the stomach in four hours.

Most of the breakfast is still in the small intestine when dinner is eaten. The vigorous peristaltic waves set up by the dinner carry the breakfast over into the colon where it is slowly worked along toward the lower end. Normally, digestion and absorption are complete in eight and one-half hours and the food residue has then reached the transverse colon.

Supper gives the food procession another push which carries the dinner into the first part of the colon and ought to push the breakfast residue out by means of a bowel movement occurring after supper or before bedtime.

The next morning the dinner residue should be dismissed before breakfast and the supper residue after breakfast or soon after dinner.

This is the writer's opinion of the normal alimentary cycle, but it is by no means always realized in actual experience. The colon of the average man is in the condition of a congested railway system. The right of way is choked and if bowel movements occur they are belated, two or three days in arrears. The residues of half a dozen or more meals are packed away in the colon undergoing putrefaction and poisoning the body. The normal period is less than 24 hours.

Length of Time for Digestion

Q. **What length of time is required for the digestion of food?**

A. During the first four hours the process of gastric digestion is completed, and the food slowly passed out of the pylorus into the small intestine. At the end of four hours more, or eight hours from the time food is eaten, the intestine is émpty and the unusable residues are found accupying the right half of the colon. It thus appears that the complete process of digestion occupies about eight hours. It is now known that the most important part of the digestive process takes place in the small intestine. The stomach does not digest the food

completely but only prepares it for the work to be done in the small intestine.

Oxalic Acid in Foods

Q. **Do the tomato and other common foods contain oxalic acids in injurious amounts?**

A. Tomatoes do not contain any considerable amount of oxalic acid,—less than one two-hundredth of one per cent; rhubarb contains one-fourth of one per cent or fifty times as much. That is, one pound of tomatoes contains one-third of one grain of oxalic acid while a pound of rhubarb contains seventeen grains of this poison. The acid of tomatoes is citric acid. Most vegetables contain a minute amount of oxalic acid. The following list comprises those vegetables which contain this acid in any considerable quantity.

Sorrel	0.274 to 0.363	per	cent
Spinach	0.191 to 0.317	"	"
Rhubarb	0.247	"	"

It should be remembered that by parboiling, the oxalic acid may be practically all removed as it is a very soluble substance. For this reason spinach and other foods which contain oxalic acid in considerable amount should always be parboiled in preparation for the table. Rhubarb should be wholly excluded from the human bill of fare.

Canned Foods

Q. **May the use of canned goods, such as corn, peas, fruit, etc., be harmful in any way? Should the water be poured off the peas and beans before they are used?**

A. Canned goods may contain a sufficient amount of tin to produce harmful effects. If the liquid portion of canned vegetables is thrown away considerable valuable nutrient material is lost, especially highly valuable salts. Only reliable brands of canned goods should be used.

Canned foodstuffs are also lacking in vitamines and on this account should never be made a staple article of diet. Vitamines are now known to be highly essential for good nutrition. Though present in foodstuffs in very small amounts, when destroyed by cooking or removed by milling processes the result is development of such grave diseases as beri-beri, scurvy and possibly also pellagra. Ordinary cooking does not altogether destroy vitamines in vegetables, but the high temperature employed in the canning industry easily destroys vitamines present in the foods.

Peptogenic Foods

Q. **What foods encourage the flow of gastric juice?**

A. Agreeable foods and those which stimulate the appetite cause the formation of highly active appetite juice. This is not, of course, a recommendation for condiments, such as mustard, pepper, and other irritating substances; for while these possibly stimulate the flow of juice into the stomach, they at the same time create an irritation which leads to gastric catarrh, and finally to destruction of the secreting glands. The formation of gastric acid is encouraged by concentrated sweets, such as malt honey, raisins, prunes, and concentrated fruit juices.

Acids and Starches

Q. **Do acids and starches disagree?**

A. Many people labor under the impression that acid fruits should not be eaten in connection with starchy foodstuffs. It is true that in cases of extreme hyperacidity fruit acids sometimes increase the amount of acid formed and in such cases the great excess of acid in the stomach may interfere with the digestion of starch in the stomach. In such cases, however, it is only necessary to take care to take starchy foods in the form of puree and to swallow with little or no mastication, adding at each meal one or two dessert spoonfuls of olive oil. By this means an excessive formation of gastric acid may be checked.

Predigested Foods

Q. **Do predigested foods weaken the stomach?**

A. No. It should be added, however, that a certain proportion of the food each day at each meal should consist of foods in a natural state which have not been subjected to any artificial process.

Foods of this kind contain vitamines and perhaps other important elements which are lacking in foods which have been processed.

Vegetable Proteins Less Putrescible Than Flesh Proteins

Q. **Are vegetable proteins less likely to encourage putrefaction in the colon than flesh proteins?**

A. Yes, According to Torrey, "In feeding experiments with dogs it has been shown that two carbohydrates, lactose or dextrin, when added to a meat and rice diet caused such a marked development of aciduric bacteria of the *B. acidophilus* type that they completely dominated the fecal flora and effected the almost complete suppression of proteolytic types commonly found in the canine intestinal tract, even including B. coli.

"This purely fermentative flora would, furthermore, persist as long as the diet was continued, there being no tendency to reversion to the so-called normal flora. B. bifidus sometimes increases greatly under these dietary conditions, but generally was soon overgrown and suppressed by B. acidophilus, and, in fact, very rarely became the dominant type. A diet of bread and milk, which naturally contains both lactose and dextrin, was also followed by the establishment of a fecal flora consisting almost entirely of B. acidophilus."

"Starchy foods all tended to effect a simplification of the intestinal flora and an elimination of obligate putrefactive bacteria. These foods with a large starch content differed in some degree in their efficiency as transforming agencies. White bread, potatoes and beans all tended to bring about a predominance of *B. acidophilus*, whereas rice proved rather less effective as an antiputrefactive agent.

"Various proteins were found to differ radically in their effect upon the intestinal flora, depending upon their source. Of the varieties

tested the proteins of mammalian tissues were the only ones which markedly encouraged the growth and activity of the obligate putrefactive bacteria within the intestinal tract. A diet of fish brought to development a flora which was entirely different from that appearing in association with the feeding of beef hearts. Spore-bearing bacteria did not appear in the fecal specimens in more than insignificant numbers. There was a notable absence of the B. welchii types which constitute so large a part of the flora in connection with a meat diet. On the other hand, bacteria of the B. coli and B. proteus types were strongly predominant. Milk casein as an article of diet exhibited far less tendency to give rise to intestinal putrefaction than did meat protein." . . . "Vegetable proteins stand in strong contrast to animal proteins, especially meat, in that they do not offer the slightest encouragement to the growth of intestinal putrefactive types of bacteria.

"In fact, with a bread containing a very high protein content with a minimum of carbohydrate as marked an overgrowth of aciduric intestinal bacteria occurred as was observed in connection with diets to which considerable amounts of lactose or dextrin had been added."

The Anti-toxic Effect of Milk Sugar

Q. **What form of carbohydrate most encourages the growth of friendly, or acid-forming bacteria?**

A. All carbohydrates tend to encourage the growth of acid-forming bacteria, but milk sugar

and malt sugar are the best adapted to encourage the development of those protective organisms which thrive in the alimentary canal. Mendel, of Yale University, tells us that "Herter and his associates were the first to demonstrate clearly the dependence of the types of bacteria developing in the alimentary canal upon the chemical character of the diet. In general it may be said that abundance of carbohydrates tends to favor the preponderance of the acid-forming types, whereas proteins permit the appearance of putrefying bacteria. Thus one may recall Torrey's observations on the effect of various high-calory diets upon the fecal flora of typhoid fever patients. It was shown by him that with some cases if lactose were added in amounts of 250 to 300 grams a day to the other ingredients of the Cole-Shaffer diet there resulted a transformation of the fecal flora from the ordinary type to one strongly dominated by B. acidophilus."

Length of Life without Food

Q. **How long can a person live without food?**

A. Physiologists tell us that fifty days is the longest fast scientifically recorded and it is not regarded as probable that any human being can live more than fifty days without food. The length of time a person can fast depends primarily on the amount of fat and flesh possessed at the beginning.

The Green Leaf

Q. **Why are greens essential for complete nutrition?**

A. Greens contain in abundance both iron and lime food substances, which are likely to be deficient in some other foods, but the green leaf also possesses other very remarkable properties which make it an essential element of a complete dietary.

The most marvelous chemistry known to man is that which is wrought out in the secret laboratory of the green leaf. The sun is the alchemist, the chlorophyl grain the reagent. Here, in this simplest of laboratories, are wrought out all the marvelous products of the vegetable kingdom. Here are produced the subtle elements from which come all the curious gums and resins, oils and essences, all the delicate aromas, the attar of the rose, the fragrance of the lily, the delicate scent of the violet, the penetrating odors of the leek and the garlic, the sporous smell of the poppy, all the deadly poisons of the nightshade and hemp, upas tree and bitternut, all the rainbow tints of leaf and flower, all the proteins and starches and fats of foods, and the grain and fibre of all woods, and the bark of tree and bush and twig in all the forests of the wilderness.

Chlorophyl was once supposed to be a single color, but now we know there are four, two greens and two yellows; and from these are compounded all the rest of the numberless tints that beautify the world of flowers in field and glen.

But the end is not yet. In the wonderful green leaf, itself, the scene of marvelous activity in growth and development, is produced a sub-

stance that imparts to the young of animals the power to grow. Here is the explanation of the marvelous growth of calves, colts, rabbits, guinea-pigs and antelopes. They seem almost to grow and expand before one's very eyes while he stands gazing in wonder and surprise.

Without this subtle vitamin which promotes growth and development, no animal could grow to maturity. Without it the reproduction of animal life would soon cease, and the world become waste and void.

It is for this reason that green vegetables, and especially "greens," are so important an element of the dietary. Cabbage, lettuce, spinach, cucumbers, greens of all kinds—some of these should be a part of every meal.

Here, too, is found the explanation of the importance of milk and dairy products in Nature's scheme of animal nutrition. In her peregrinations about the pasture, the cow gleans from grass and tender buds and twigs the precious vitamins, and gives them back in her generous lacteal flood at milking time.

It is for this reason that butter is superior to other fats, and milk, even skimmed milk, becomes a precious food resource for man, whose stomach lacks capacity to handle the amount of green stuffs necessary to supply the full requirements of growth-promoting vitamins.

And thus the green leaf becomes one of the most important of food products. This is the reason that the Russian clings so tenaciously to his sauerkraut, the Turk to his yogourth, the Frenchman to his salad.

Why Dogs Are Short-Lived

Q. **Why are dogs short-lived animals?**

A. According to Professor Metchnikoff, the dog is short-lived because he is a meat-eater. Says Metchnikoff:

"The dog is a carnivorous animal and it is proved beyond doubt that animal food produces the largest quantity of these poisonous substances which it is our aim to destroy.

"Should it be possible to give the dog a large quantity of vegetables, he would undoubtedly be immune from a great many diseases which are now caused by the presence in his intestines of poisonous indols and phenols."

Satisfying Foods

Q. **What foods produce satiety?**

A. The sense of satiety, or satisfaction, experienced after eating depends more upon the bulk taken than upon the quality of the food. However, it is noticeable that fats have a very decided influence in producing a sense of satiety.

Blood Making Foods

Q. **What are blood making foods?**

A. For the making of pure blood the first essential is pure food, and not blood or blood-containing food. If the blood has been greatly reduced in quantity, it is important to take food rich in proteins. These are furnished in abundance by many of the natural foods. Among the choicest of these are nuts, especially almonds, peanuts, Turkish hazelnuts, or filberts, pecans, and all nuts from which the outer shells and skins can be readily removed. A pound of nuts con-

tains more blood-forming material than a pound and a half of beefsteak. Peas, beans, and lentils are also splendid blood-formers, containing more than one-fourth their weight of blood-making material, and each pound equal in food value to three pounds of beef.

Whole-wheat bread and gluten preparations of all sorts are also good blood-making foods. All foods which hinder digestion, and which give rise to fermentation or other disturbances, must be carefully avoided, as the acids formed by the souring of the food serve to lessen the alkalinity of the blood, and thus to deteriorate its quality. This is not true of the acids found in fruits.

These are food substances, and unless taken in very great excess are highly beneficial. Acid fruits encourage the action of the kidneys, and thus aid in the removal of the poisons, while they at the same time disinfect the stomach and intestines, and thus prevent the formation of poisons by fermentative and putrefactive processes.

Fresh vegetables must not be overlooked. The valuable vitamines which they contain render the body the greatest service. Lettuce, celery, tomatoes, cucumbers, all fresh foods are most excellent blood purifiers.

Last, but not least, must be mentioned foods rich in iron, such as bran, egg yolks, and especially greens. Contrary to popular belief, red meats are not the best blood building foods. Greens contain three times as much iron as does beefsteak, and even such fruits as the strawberry are equal to beefsteak in iron con-

tent. See accompanying tables for further information.

The Iron Ration

Q. **How much food iron is needed daily, and what are its uses in the body?**

A. The body requires more than one-fifth of a grain of iron daily to make good its losses. Nearly all the iron of the body (grains) is found in the blood; but a trace of iron enters into the composition of nearly all the tisues. The iron of the blood carries oxygen from the lungs to the tisues in the form of hemoglobin, which is spread out in the red cells to an extent equaling one acre in area.

Foods Rich in Iron

Q. **What foods are richest in iron?**

A. In general, greens or foods rich in chlorophyl have the largest content of iron, of which 25 hundredths of a grain are necessary to make good the losses of iron which occur each day. The following table shows the fraction of a grain of iron contained in one ounce of each of the greenstuffs named (1) and the number of ounces needed for one day's iron ration (2):

	(1)	(2)
Celery	.0022	105.0
Chard	.0100	23.0
Dandelion greens	.0118	19.0
Endive	.0106	21.0
Lettuce	.0031	77.0
Mustard greens	.0213	11.0
Paprika		4.0
Romaine	.0525	4.0
Spinach	.0158	13.0
Turnip tops	.0152	14.0
Watercress	.0083	26.0

	(1)	(2)
Mountain Spinach	.008	27.0
Lambs quarter	.009	23.7
Red Root	.028	7.6
Purslane	.008	27.0
Rainbow Chard	.009	23.7
New Zealand Spinach	.009	23.7
Zeninoa	.005	42.6
Turnip Tops	.010	21.3
Narrow Leaf Dock	.028	7.6

(See also Health Foods, page 264.)

Iron in Animal Foods

Q. **Are animal foods rich in iron?**

A. The yolk of eggs is very rich in iron, but with this exception flesh foods are not especially rich in this important food element; in fact, ordinary beans contain nearly double the amount of iron contained in the best beefsteak. Almonds contain, ounce per ounce, a little more iron than does beef. Egg yolk contains more than twice the amount of iron found in the best beefsteak. Spinach contains the same amount of iron as does beefsteak, and romaine contains three times as much.

The following table shows the amount of iron (grains) contained in one ounce each of various animal foods (1) and the number of ounces needed to furnish one day's iron ration (2):

	(1)	(2)
Milk, whole	.0011	200.0
Milk, skimmed	.0011	200.0
Milk, condensed	.0036	60.0
Milk, sweetened		
Buttermilk	.0011	200.0
Cheese	.0057	40.5
Cheese, cottage	.0042	55.0
Cheese, yogurt	.0043	51.0
Cream	.0010	231.0
Butter	.0009	256.0

	(1)	(2)
Whey		
Milk, human	.0023	
Eggs	.0111	17.5
Egg one (1.86 oz.)	.0244	(9 eggs)
Egg yolk	.0376	6.0
Egg, yolk of one egg (.6 oz.)	.0226	(9.5 yolks)
Egg, white	.0004	580.0
Egg white, one egg (1.26 oz.)	.0005	(426 eggs)
Mutton	.0000	00.0
Beef, all lean	.0170	13.6
Beefsteak, med. fat	.0097	24.0
Chicken (same as beef)		13.6
Fish	.0029	80.0
Blood	.2301	1.0

Foods Richest in Food Lime

Q. **What foods contain the largest amount of food lime?**

A. In general, milk products, yolks of eggs, greens, legumes, and nuts contain the largest proportions of food lime. The amount of food lime required for one day's ration is fifteen grains. The following table shows the amount of lime in grains contained in one ounce of each of the several foodstuffs mentioned (1) and the number of ounces which supply a day's ration of food lime (2):

	(1)	(2)
Almonds	1.464	10.5
Beans, dry	.980	15.7
Beans, soya	2.000	7.7
Bread, Boston brown	.790	19.5
Brose	.485	32.0
Buttermilk	.645	24.0
Cabbage greens	.649	23.7
Cauliflower	.753	20.4
Celery	.478	32.2
Chard	.919	16.7
Cheese	5.702	2.7
Cheese, cottage	4.180	3.7

	(1)	(2)
Cheese, yogurt	4.285	3.0
Cow peas	.612	25.1
Cottonseed meal	1.623	9.5
Currants, dry, Zante	.502	30.7
Dandelion greens	.643	24.0
Dates	.400	38.6
Eggs	.450	34.2
Egg yolk	.839	18.3
Endive	.637	24.0
Figs, dry	.992	15.5
Gluten, pure	1.025	15.0
Gluten, 40%	.400	38.0
Hazelnuts (filberts)	1.758	8.8
Kohl-rabi	.472	32.6
Lentils, dry	.655	23.5
Linseed meal	2.530	6.1
Maple syrup	.655	23.5
Milk skimmed	.747	20.6
Milk, whole	.735	21.0
Milk, condensed, sweetened	1.837	8.4
Molasses	1.292	12.0
Mustard greens	3.013	5.1
Oatmeal	.423	36.4
Okra	.435	35.4
Olives	.747	20.6
Paprika	1.401	11.0
Peas, dry	.514	30.0
Peanuts	.435	35.4
Pecan nuts	.545	28.2
Protose	.416	37.0
Raisins	.392	39.3
Rutabagas	.435	34.0
Spinach	.410	33.6
Turnips	.392	39.3
Turnip tops	2.125	7.2
Walnuts	.545	28.3
Watercress	1.153	13.4
Wheat, bran	.735	21.0
Wheat, germ	.435	35.4
Whey	.269	57.2

Lime Content of Animal Foods

Q. What animal foods contain most lime?

A. In animals the lime is deposited in the bones, which contain 99 per cent of all the lime in an animal's body. The following table shows the amount of lime (CaO) in grains contained in one ounce of the several foodstuffs named (1) and the number of ounces required for one day's lime ration (2):

	(1)	(2)
Milk, whole	.735	21.0
Milk, skimmed	.747	20.6
Milk, condensed, sweetened	1.837	8.4
Buttermilk	.643	24.0
Cheese	5.702	2.7
Cheese, cottage	4.180	3.7
Cheese, yogurt	4.285	3.0
Cream	.527	29.2
Butter	.092	167.4
Whey	.269	57.2
Milk, human	.208	70.0
Eggs	.450	34.2
Egg yolk	.839	18.3
Egg white	.092	167.4
Beef, tenderloin	.057	270.0
Chicken, broilers	.066	235.0
Fish	.134	114.6
Blood	.049	

The Lime and Iron Content of Health Foods

	(1) Lime (CaO) Grains	(2) Iron (Fe) Grains
Protose	.416	.025
Nuttolene	.263	.017
Gluten, pure	.498	.149
Gluten, 40%	.191	.060
Gluten, 20%	.095	.030
Meltose (Malt Honey)	.122	.015
Savora	1.207	.626
Brose (Oatmeal and Bran)	.485	.020
Malt Sugar	.262	.021
Malted Nuts	.433	.019

Uric Acid in Foods

Q. **Is the amount of uric acid found in different foods known?**

A. Doctor Hall of Manchester, England, devoted a year to the study of this question. The following table shows the results of his carefully conducted studies:

	Grains per Pound
Fish	8.15
Mutton	6.75
Veal	8.14
Pork	8.48
Sweetbread (thymus)	70.53
Beefsteak	14.45
Liver	19.26
Oatmeal	3.46
Peas	2.54
Beans	4.17
Potatoes	0.14
Asparagus	1.50
Tea	3.22
Coffee	4.53
Milk	0.00
Eggs	0.00
Cabbage, lettuce	0.00
Cauliflower	0.00
Rice	0.00
Wheat Bread (white)	0.00

Peas and beans are the only common vegetable foods which contain more than traces of uric acid. The amount is very small. If comparison is made of the actual dry substance, beefsteak contains twenty-two times as much uric acid as peas and fourteen times as much as beans. By par-boiling, the uric acid of peas and beans may be removed.

Laughing an Aid to Digestion

Q. **How does laughing aid digestion?**

A. The moving of the food from place to place along the alimentary canal is done chiefly by the intestine itself, but in part the work is done by the diaphragm. The stomach lies just underneath the diaphragm, which is simply a thin muscular partition, with the heart on one side and the stomach on the other. In action the diaphragm moves up and down upon the stomach. As we breathe out and in the diaphragm moves the stomach up and down, so that the contents of the stomach are churned by the process. If one breathes deeply, this churning movement is quite vigorous. If one breathes very slowly and superficially, then the action of the diaphragm upon the stomach will be very little. This is the reason why, when people go to sleep directly after eating, food remains a long time in the stomach. The breathing is repressed to such a degree when we are asleep that the food remains in the stomach nearly twice as long as when we are awake. The effect of laughing is to increase the action of the diaphragm. A hearty laugh thus renders valuable assistance to digestion, not simply because there is a pleasant state of mind, which makes the condition favorable for all the functions of the body, but because of actual mechanical assistance.

Amino Acids

Q. **What are amino acids?**

A. Modern chemical researches have shown that all proteins are made up of a considerable

number of substances to which the term amino acids has been applied. These substances, sometimes spoken of by writers on dietetics as "building stones," differ in number and in kind in the different proteins; indeed the difference that is recognizable between proteins from different sources, animal and vegetable are due to the difference in the kind, number and proportions of the amino acids of which they are composed. Every plant produces proteins peculiar to itself. The proteins of the different tissues of the body also differ. In the process of digestion protein is reduced to these amino acids, which after absorption are circulated in the blood to the several tissues and are by the individual cells of the body reassembled, each class of cells or tissues making from the building stones the kind of protein which is required for its growth and repair.

Effect of Starvation Upon Body Cells

Q. **What is the effect of starvation upon the body cells?**

A. Although there is a constant loss of protein during starvation it is now known that this does not result from the actual death or destruction of any considerable number of cells, but rather a diminution in the size of the individual cells. The cells become thinner as their stores of energy are exhausted, but do not actually perish.

Fasting

Q. **Is fasting beneficial?**

A. There are certain conditions in which fasting is necessary and to the highest degree beneficial, as for example in cases of gastric or

duodenal ulcer, especially if accompanied by hemorrhage, after operations upon the stomach and sometimes in fever cases. The idea that fasting is highly beneficial as a means of freeing the body of poisons has little scientific foundation. The worst poisons from which the body suffers are those which result from putrefaction in the intestine. If the intestine can be thoroughly freed from putrefying substances and kept free the body quickly clears itself from other poisons through the cleansing power of the blood which washes every tissue and is itself purified though the action of the kidneys, lungs and depurating organs. The chief advantage ordinarily gained by a fast is restriction of the amount of protein taken into the body. Essentially the same advantages may be obtained by adopting a dietary which contains little or no protein for some days. The elimination of fats is also sometimes beneficial. There is rarely any advantage in withholding carbohydrates, that is, starch and sugar.

Carbohydrates are anti-toxic and render valuable service in destroying the poison-forming bacteria. It is important that the intestinal secretions and excretions should be regularly discharged from the body during fasting as well as at other times. Daily movements of the bowels may be secured by the taking of substances which supply bulk without protein.

The damage done to the body by long fasting is simply appalling. Experiments and observations made upon animals and upon human beings who have been subjected to prolonged fasts have afforded abundant evidence of the terrible

consequences to the various bodily organs, as a result of the determined effort of the body to maintain animal heat and the various bodily activities in the absence of a proper food supply. The situation of the body may be aptly compared to that which exists in a home during a fuel famine. In the absence of coal or other fuel, rather than freeze to death the occupants of the house burn up the furniture, and even tear up floors and break down the partitions to keep the fire going. Of course if there had been a considerable amount of fuel on hand, the destruction of the house would naturally be postponed until the store of fuel was exhausted.

This is perfectly analogous to what occurs in the body. An extra accumulation of fat may be reduced by a fast without particular injury, as an excess of fat represents a surplus of food which has been taken in and deposited as residual tissue. The hunger cure, administered with caution and under medical supervision, is, indeed, an excellent remedy in obesity; but in persons who have no surplus fat to protect the active tissues, the destruction of the various organs begins at once with the commencement of a fast.

Abnormal Appetite

Q. **What is the best means of controlling an abnormal appetite?**

A. Thorough mastication of the food. In such cases it is well to take a little food half an hour before the meal. This has a tendency to lessen the appetite.

It is also highly important to eat much bulky food and especially at the beginning of a meal,

such foods as lettuce, spinach, turnips and bran or agar-agar.

Appetite and Instinct

Q. **May the diet be regulated by instinct?**

A. Modern investigation seems to show that the nutrition of the body is protected by instinctive functions which, if followed, will serve as accurate guides, not only to the amount of food, but also as to the kind of foods which should be eaten.

Laboratory dogs instinctively regulate and select their own diet.

A dog taking no exercise eats less than a dog taking exercise.

On warm days dogs refuse food which will be eaten on cold days. This was probably true of man before the advent of cookery.

Pigs and rats when permitted to choose their own foodstuffs, make a better selection of the several nutritive elements than the wisest expert in diet can make for them.

Lower animals still possess these instincts, but human beings have so long disregarded the real needs of the body that even intelligent people are often unable to interpret properly the meaning of appetite or hunger. The average man, in other words, does not stop to consider whether the inclination to take food may be prompted by an actual bodily need or whether it is simply a desire to gratify his sense of taste. Many people make a practise of taking food in as large quantities and as frequently as they find it possible to eat with a relish.

Horace Fletcher made the interesting discov-

ery that by thorough mastication of the food the gustatory nerve is afforded an opportunity to appreciate the nutritive qualities of the food and becomes able to make a selection of nutritive principles suited to the body's needs.

An excellent illustration of this is found by Taylor in the fact that most people eat four or five times as much common salt as the body can find any use for.

Sitophobia

Q. **What is sitophobia?**

A. Sitophobia is morbid fear in relation to food, or an aversion to foods resulting from strong mental impression. Nearly every person has experienced the loss of relish for some well liked dish after having encountered a disappointment due to the blunder of a cook or an attack of indigestion following indulgence in a favorite dish. The success of the Keeley cure was based upon this principle. The patient was informed that he could drink whiskey as often and as much as he pleased, but care was taken just before the whiskey was swallowed to administer an injection of apomorphia, a substance which produced after a few minutes, great nausea. The patient attributed the nausea to the whiskey and protected him against the alcohol so long as the impression lasted. A recent writer on sitophobia gives an account of a man who lost his appetite for cat fish after having discovered the putrid carcass of a cow entangled in the river weeds of his favorite fishing place and surrounded by a school of catfish. A boy who was very fond

of apple dumpling lost his appetite entirely for this toothsome dish after having suffered a fit of indigestion from eating more dumpling than his stomach was able to dispose of.

The World's Future Food Supply

Q. **Is there danger of a nation wide or world wide shortage of food?**

A. We have six million farms, a billion acres, half under cultivation. That is, Uncle Sam every year plants 500,000,000 acres, almost 1,000,000 square miles, and gathers the crop.

And here is the crop:

Corn	184,000,000,000	lbs.
Wheat	41,700,000,000	"
Oats	37,500,000,000	"
Rye	1,320,000,000	"
Barley	5,400,000,000	"
Rice	680,000,000	"
Sweet Potatoes	3,426,000,000	lbs.
Potatoes	20,280,000,000	"
Sugar Beets	1,586,706,000	"
Apples and other fruits	13,000,000,000	"
Beans	619,000,000	"
Total	309,511,000,000	lbs.

An annual crop of more than three billion pounds of substantial food, 3,000 pounds, a ton and a half, for each inhabitant. And yet we talk about hunger and famine!

Allowing one million calories a year (more than a full ration for an average adult) for every one of the 100,000,000 children of Uncle Sam we find that the annual crop is ample to

feed them all and there will be enough left over to feed more than three times as many more. In other words, the staple vegetable foods produced annually in the United States will suffice to feed amply more than 400,000,000.

What becomes of this enormous crop of good foods?

There are others. Besides the 100,000,000 human inhabitants of the United States there are 200,000,000 others with big hungry mouths. Horses, oxen, cows, mules, sheep, pigs, all busy eating up our farm crops, besides occupying an enormous area of land that might otherwise be utilized in rearing food crops.

Our 22,000,000 milch cows we need of course, and the 25,000,000 horses and mules we shall have to keep until the time when tractors have taken their places; but the 47,000,000 steers and 48,000,000 hogs we can easily get along without.

As the population of the world increases, man will be compelled to return to his natural, biologic diet by economic forces which he cannot possibly ignore nor set aside. China, Japan, India, other old civilizations have proven this. So, as the great Virchow once said, "The future is with the vegetarians." Why not begin now? This is an easy, sure, safe and scientific solution of the food problem which now confronts the country and the world.

Fish Diet and Beri Beri

_Q._ Is beri beri caused by other food substances than polished rice and other incomplete cereals?

A. Recent observations have shown that a fish diet is no protection against beri beri. Philippino laborers, who subsist upon a ration of a pound and a half of rice and a half a pound of fish, suffer greatly from beri beri. The disease is also very frequent among the fishermen of New Foundland. The Philippinos eat no dairy products and very few fresh fruits or vegetables.

The idea that animal flesh is the essential food remedy for beri beri is thus again discredited, as many times before. It is now perfectly well known that the thing lacking is a subtle vitamin found in the bran of rice but not in polished rice. This vitamin is also present in great quantity in yeast, in orange juice, in the potato, and in fact, in most entire vegetable products which have been in no way changed by human manipulation.

Chilli

Q. **What is chilli; and is its use injurious?**

A. Chilli is a term sometimes used for a variety of red pepper. Its use produces the same injurious effects as pepper in other forms. The essential oil of pepper is a highly irritant substance. According to Williams, an eminent English authority on foods, the oil of cayenne is nearly as poisonous as prussic acid. The effect of the contact of this highly irritating oil with the skin and the mucous membrane of the eye is well known. Intense congestion and irritation often followed by severe inflammation are the result of an external application of cayenne,

capsicum, or chilli. The actual effect of an internal application of this poisonous substance is essentially the same as that of an external application, though not so immediate or severe, for the reason that the irritant is diluted, and its effects thus attenuated by the admixture of mucus and other secretions. The effect of the repeated irritations of the stomach produced by the use of chillis, pepper, capsicum and allied substances is to induce a chronic inflammation which finally results in gastric catarrh and destruction of the glands of the stomach and apepsia. Boix of Paris showed that pepper produces hardening of the arteries and gin liver, and that it is six times as active a poison as gin.

Condiments

Q. **Are such spices as cinnamon, nutmeg, pepper, cloves, and ginger proper foods?**

A. Spices and condiments of all sorts are not foodstuffs in the ordinary sense. While it is probably true that these substances may be used in extremely minute quantities for a long time without apparent injury their free use is highly objectionable. They finally irritate the stomach, damage the liver and kidneys and when freely used produce hardening of the arteries and high blood pressure. Persons who suffer from kidney disease, arteriosclerosis, hyperacidity, gallstones or urinary disorders of any sort should especially avoid the use of condiments. The minute quantities of cinnamon or nutmeg sometimes used in flavoring beverages cannot cause serious injury; but fatal poisoning from nutmeg has been reported.

Phosphates

Q. **What are the best sources of phosphates?**

A. Phosphates are found in abundance in whole grains, especially in oat meal, cracked wheat, wheat flakes, graham bread and other whole grain preparations. Wheat bran is of course very rich in phosphates. Milk also contains phosphates in abundance.

Pickles

Q. **Why are pickles considered unwholesome?**

A. Pickles, being hardened by the action of acetic acid and salt, perhaps with the addition of alcohol, become almost absolutely indigestible. When taken into the stomach they resist the action of gastric juice much as would sawdust or pebbles, and become a source of great irritation and even of inflammation and chronic disease. Green olives, brandied peaches, and other preserves must be put in the same category. Fresh, crisp cucumbers are very wholesome for persons whose digestive organs are in a fair condition. Lemon juice should be substituted for vinegar. The acid of vinegar has been shown by Boix to be twice as active as alcohol in producing "gin liver." It is quite unwholesome for well persons, and must be rigorously excluded from the bill of fare of the invalid.

Benjamin Franklin a Diet Reformer

Q. **Was Benjamin Franklin a vegetarian?**

A. In his autobiography Franklin describes his diet as, at least at certain periods, strictly excluding flesh meats of all sorts. He declares that on this simple fare he found himself able to do more work than his companions on their ordinary meat fare and that the expense of the food was scarcely as great.

Franklin became so much engaged in politics and in the struggle of the colonies for independence that he seems to have made no serious effort to propagate his heretical dietetic views, but in his autobiography he not only mentions his experiments with a non-flesh dietary, but clearly declares his belief in its efficiency and superiority.

Sulphuric Acid in Fruit

Q. **Is there any test to determine whether the dried fruits in the market contain sulphuric acid?**

A. Yes. To a decoction of the fruit to be tested add a few drops of a ten-per-cent solution of barium chloride. A white precipitate may result. If this still remains after the addition of two or three drops of strong hydrochloric acid, it is evidence of the presence of excess of sulphates.

Alum in Baking Powder

Q. **Is alum injurious when used with foods in the form of baking powder?**

A. Alum is an astringent, an emitic, and a mild escharotic. In solution, alum condenses the tissues by coagulating their albumin. It is a poison, and produces gastrointestinal irritation.

Baking Powder

Q. **Are baking powders harmful?**

A. The free use of baking powders, as well as the free use of common salt, is unquestionably responsible to a degree at least for the dyspepsia which has come to be almost universal at the present time. Simplicity is the first essential to safety. The addition of chemical substances of any sort to our natural foodstuffs is unwise and dangerous. Funk states that the alkalis of baking powders may destroy vitamines.

The No-Breakfast Plan

Q. **When a person eats no breakfast, is it best to take a little fruit or to eat nothing?**

A. If one has little appetite in the morning it is better to make the breakfast consist of fruit, or fruit and bran with lettuce and celery. A breakfast of this sort will furnish bulk, whereby the bowels will be stimulated to action without imposing any heavy burden upon the digestive glands since the amount of nutriment afforded by such a breakfast is so small that very little digestive fluid will be required.

Persons who eat a hearty dinner in the evening naturally have little appetite for breakfast. The stomach is not prepared for food. A better plan, however, is to take a light supper consisting of a little fruit, boiled rice, or some similar easily digestible foodstuffs, and then the

stomach will be prepared to receive and digest a heartier meal in the morning. The breakfast should never be hurried. Time should be taken for the thorough mastication of the food. It should be remembered also, that while eating a meal the food residues move along in the colon four times as rapidly as during the intervals between meals; hence, adequate time devoted to breakfast is conducive to a thorough evacuation of the colon after breakfast.

Diet in Cold Countries

Q. **Will a fleshless diet support life in a cold country like the Arctic region?**

A. That flesh food is not absolutely essential to sustain life in the Arctic regions is proven by the fact that the musk-ox, the reindeer, and other vegetable eating animals flourish in those regions, although their food is of the most scanty kind. Again, it should be remembered that the albuminous elements, which are most abundant in flesh food, are not those which supply the largest amount of heat to the body. The heat-producing elements are the carbonaceous, of which vegetables contains a large proportion in the form of starch, sugar, and fat.

Faintness Before Eating

Q. **When one feels faint before eating what is the cause?**

A. There is an irritated condition of the stomach and it means one should avoid eating large meals or bulky food and especially should avoid acids, mustard, pepper and condiments.

Hunger Pain

Q. **What is the cause of hunger and hunger pain?**

A. Hunger is due to contraction of the stomach. This is why we speak of hunger pangs. This has been demonstrated by Cannon, Carlston and others. When food is in the stomach, the movements in the stomach are comparatively slow, but when the stomach becomes empty the movements are more vigorous and after some time become so violent that one becomes conscious of them. The first sensation produced is hunger. Later, if the contractions become still more violent, a painful sensation is produced which is believed to be the result of spasm or violent contractions of the pylorus. These pains usually disappear quickly when food is taken. This hunger pain is usually felt three or four hours after eating. It sometimes occurs early in the morning before food has been taken, but is more likely to occur in the evening, especially if supper has been omitted.

Proper Reclining Position after Eating

Q. **On which side should one lie after eating?**

A. Observations made with x-ray after a bismuth meal have demonstrated that lying upon the right side immediately after eating aids the passage of food from the stomach. Persons who have dilatation of the stomach or who experience a sense of weight and heaviness or prolonged delay of food in the stomach after eating often find relief in lying upon the right side.

Benzoate of Soda

Q. **Is food containing benzoate of soda harmful?**

A. Some years ago, Doctor Wiley, then at the head of the United States Pure Food Department, condemned benzoate of soda as a food preservative. A European government having become interested in the controversy in this country appointed a board of experts which criticised the findings of the Referee board which had reversed Doctor Wiley's decision and confirmed the position taken by Doctor Wiley. The foreign commission maintained that the experiments with large doses of benzoates made by the Referee Board were of too short duration, and held that ill results might easily follow the long-continued administration of the preservative in very large doses. It also advised against the use of benzoates in food on the theoretical ground that, though they were evidently innocuous in small doses, one might eat and drink in the course of the day so many things containing them that a sufficient quantity might be taken to be injurious.

Benzoic Acid

Q. **In what foods is benzoic acid found?**

A. Benzoic acid is reported to be present in cranberries, prunes and plums, but the amount is insufficient to require consideration except in cases in which it is necessary to suppress entirely all acids which are not readily oxidized in the body, since benzoic as well as oxalic acid is not oxidized in the tissues, and is excreted through the kidneys.

Vinegar Is Harmful

Q. **Is acetic acid or vinegar harmful?**

A. Boix of Paris and other experimenters have made investigations with acetic acid which demonstrate that this acid is a poison and produces in the liver changes identical with those produced by gin. Sir William Roberts, many years ago, showed that acetic acid interferes with digestion preventing the action of the saliva upon starch. A teaspoonful or two of vinegar was shown to be sufficient to entirely stop the action of the saliva. Oxalic acid, the acid of pieplant, acts in a similar manner, but is still more poisonous. These acids cannot be used in the body, but are excreted, unchanged, the same as hydrochloric acid and other mineral acids. Citric acid and malic acid are utilized the same as starch and sugar but have only one-half the nutritive value of these substances. Vinegar is also highly injurious to the liver, sometimes producing cirrhosis.

The "wrigglers," or vinegar eels, which good cider vinegar nearly always contains, it has been recently claimed by eminent scientific authorities, often take up their abode in the intestine, becoming parasites, like the tape worm and other parasitic organisms.

Flax Seed

Q. **Is flax seed a good laxative?**

A. Flax seed used in its ordinary form is highly indigestible, and hence may act as a stimulant to the intestine. It has no specific laxative properties.

Time for Meals

Q. **What are the best hours for meals, especially for the dinner hour?**

A. Food is fuel. It supplies energy to the body just as coal supplies energy to a locomotive. The body begins to receive energy from the food almost immediately after it is taken into the stomach. The intake of energy from food increases steadily for the first three hours, then it begins to diminish. It is evident then, that a hearty meal should be taken early in the day instead of late at night. A portion of the food taken is stored up in the liver for use when needed. When a hearty meal is taken at night the liver has to carry a heavy load for some hours before it can be unburdened, and much to its disadvantage.

One Meal a Day Plan

Q. **Some persons have advocated the plan of eating once a day. Is this plan a good one?**

The number and order of meals is usually determined by the nature of one's work. The idea arrangement is, breakfast at nine or ten, and dinner at three or four, with no hard work to be performed after dinner, for experiments have shown that digestion proceeds with difficulty during the performance of work. The more common two-meal plan, luncheon at noon and dinner at six, is good, provided special attention is paid the quick digestibility of the dinner, in order that digestion may be completed before one retires at night, digestion being more difficult during sleep than during work. The

three-meal a day plan is not necessarily disadvantageous if care be taken that no more food is taken with the three meals than the system really needs. Where, however, an early breakfast is eaten, with a light luncheon, a sufficient number of calories have been taken to make unnecessary a heavy, several-course dinner.

When an individual's work is extremely sedentary, calling for constant sitting at a desk, the total ration will in most cases be cut down to a point indicated by the individual's appetite. The amount called for will vary with the seasons, more food being needed during the winter months than in the summer.

The number of meals depends also upon the sort of food taken and the amount. Liquid food containing little fat, such as buttermilk, fruits and fruit juices readily passes out of the stomach. When a considerable amount of fat is taken, or after a meal consisting largely of vegetables, quite an interval must elapse before the taking of food again for the reason that fat and vegetable substances remain a long time in the stomach. In a case of gastric dilatation the ability of the stomach to empty itself is greatly impaired. It is better to take foods which quickly become liquid in the stomach and hence are easily passed from the stomach into the intestines. Among the articles especially to be avoided by a person suffering from gastric dilatation are pastries of all sorts, cheese, fermented breads except in the form of zwieback, meats of all sort, and of course, tea, coffee, and breadstuffs prepared with alkalies or baking powders. Butter must be taken in small quantity.

It generally may be advantageously replaced by yogurt cheese or cream combined with buttermilk, especially yogurt buttermilk.

Yogurt

Q. **Can the yogurt germ live in the stomach and intestine?**

A. The yogurt ferment passes out of the stomach with liquids which are present before the acidity of the gastric juice becomes sufficiently pronounced to injure it. The yogurt germs are accustomed to acids.

It is true, however, that the alimentary canal is not the natural home of the *Bacillus Bulgaricus,* and it soon dies out unless constantly reinforced by new supplies. The newly discovered germ, *B. acidophilus,* is native to the intestine and preferable.

To be efficient, the yogurt ferment must be taken in sufficiently large quantities to enable the friendly germs to completely overwhelm the pernicious bacteria. The diet must also receive attention. Scalded oatmeal or brose (cooked five minutes after the Scotch fashion) is highly beneficial. Meats must be wholly discarded.

Protein and Muscular Activity

Q. **Is protein consumed in ordinary muscular work?**

A. It was formerly supposed that protein was the special support of muscular work. Now it is generally recognized that carbohydrates and fat are the fuels of the body. Protein is only useful for repair of the body cells. Muscular work is supported by starch and sugars.

The machinery of the body is so well lubricated that the wear and tear of the machine itself is infinitesimal, so that only small quantities are required for tissue repairs. The breaking down of protein occurs in connection with exercise only when the work is so prolonged and violent that the temperature of the body is very considerably raised.

Orange Pulp

Q. **Should one eat the pulp of oranges?**

A. The pulp of the orange if well chewed may be swallowed without injury by healthy persons. One or two oranges eaten at bed time is an excellent means of encouraging bowel action. The acid of the orange stimulates peristalsis. The indigestible fiber of the pulp helps to furnish the bulk necessary for normal bowel action.

Salad Dressings

Q. **Are salad dressings which contain pepper, mustard, and vinegar wholesome?**

A. Mustard, pepper and vinegar are poisons. They are not foods and are beneficial in no way whatever, but on the other hand are highly injurious. Mustard and pepper tend to produce arteriosclerosis and are highly injurious to the liver and kidneys. They are also a cause of hemorrhoids, bladder and other genito-urinary troubles. Vinegar seriously interferes with the digestion of starch. A teaspoonful of vinegar is sufficient to destroy the starch digestion of an ordinary meal. Lemon juice is a wholesome substitute for vinegar. It is much more pal-

atable, and is constantly coming into more general use in the best cookery.

Beeswax

Q. Is wax of ordinary honey fit for food?

A. Beeswax is wholly indigestible in the human alimentary canal. It may be eaten in small amount without injury, but in quantities might prove burdensome to the digestive organs.

Glucose

Q. What is the composition of glucose syrup?

A. Commercial glucose contains about 80% of solids of which one-fourth is dextrose, a little more than one-half maltose and the balance or a little more than one-third dextrine. The sweetness of glucose is much less than that of cane sugar.

Glucose as a Food

Q. Is glucose a good food?

A. Glucose as now made appears to be less objectionable than was the earlier product. At the present time the process employed is simply boiling of the starch with a solution of one-tenth of one per cent of hydrochloric acid. The effect is to change part of the starch into sugar. A considerable portion remains in an artificial form of dextrine. The acid is neutralized by the addition of carbonate of soda forming chloride of sodium which can hardly be considered harmful, which could not be said of the residues left by the older processes in which sulphuric acid was employed. However, glucose can

hardly be regarded as being as wholesome as the natural sugars of fruits.

The Food Value of the Banana

Q. **What is the food value of the banana?**

A. Recent studies of the banana show that it is an exceedingly valuable foodstuff. Care must be taken, however, to see that the fruit is thoroughly ripened. Bananas are always picked green. Recent analyses made by A. R. Thompson, show that the green banana contains about 20% of starch, whereas the ripe banana contains practically no starch at all, the starch having been converted into sugar by the ripening process. When half ripe, the banana is slightly acid. This slight acidity disappears when the fruit is fully ripened. The thoroughly ripened banana contains only 3% of insoluble material. Carbohydrates other than starch or sugar are found in the banana in only very small amounts.

Wholesomeness of Bananas

Q. **Are bananas as ordinarily sold in the market a perfectly wholesome food?**

A. Bananas are only wholesome and easily digestible when they are well matured and thoroughly ripe. Such bananas can now generally be obtained in the markets in all our large cities. When purchasing, care should be taken to see that the fruit is plump and fully matured. It is immaterial whether they are ripened in the market or whether they are purchased green and taken home to be ripened in some warm dry place. When ready for use, the skin

of the fruit will be nearly black or quite so. The fruit should be mellow as a peach. In this condition, the banana contains a large amount of sugar and dextrin with little or no starch and is a very wholesome and easily digestible food. Great care must be taken in mastication. Every particle of the fruit should be reduced to a pulp before swallowing. A very good method of eating the banana is to reduce it to a pulp by passing through a colander. The ripe banana may be crushed in a tumbler with a knife or spoon, then beaten up to a fine pulp with a fork. When taken in this way, there is no more digestible food than a ripe banana.

Fruit Acids

Q. **Are the acids of lemons and other fruit acids wholesome for persons suffering from uric acid poisoning?**

A. Yes.

Fruit juices of all sorts contain in addition to vegetable acid, alkaline substances which aid in the elimination of uric acid. Pure uric acid dissolves with great difficulty but the urate of soda is quite readily soluble. Soda and potash are present in fruits in considerable quantities in combination with other acids. When fruit is eaten the acids are utilized or burned in the body leaving the soda behind. It combines with the uric acid and thus aids its elimination. The popular idea that the acids of fruits are unwholesome for persons suffering from gout and other uric acid disorders is a very mischievous error. The fallacy of this teaching has been pointed out for many years by scientific writers on dietetics, but like

many other popular fallacies this erroneous notion is very hard to eradicate. Rice, potatoes and fresh vegetables of all sorts are very excellent foods for one who needs to combat uric acid.

Exclusive Fruit Diet

Q. **Can life be sustained upon a diet consisting exclusively of fruits?**

A. By making a proper selection of fruits it is possible to construct a dietary quite capable of sustaining life for an indefinite period. Bananas, figs, dates, raisins and prunes contain an overabundance of nutritive material in sufficiently concentrated form to be readily available as suitable foodstuffs. The only element lacking is fats and these may be readily obtained from such fruits as the avocado or alligator pear of the tropics and by the addition of nuts to the bill of fare. Nuts are properly classed with fruits. By a combination of fruits and nuts a very complete and luxurious bill of fare may be provided.

For entire safety, however, it is better to add milk to the above bill of fare. A pint of milk a day will insure the proper intake of food lime and of the complete proteins which are necessary for the repair of the blood and of the tissues.

Seeds of Fruits

Q. **Is it dangerous to swallow seeds of fruits, such as grape seeds, cherry seeds, etc?**

A. The seeds of fruit consist chiefly of cellulose. Small seeds such as are found in figs, blue berries, raspberries and most other seedy fruits

are entirely harmless and are perhaps to some degree beneficial through increasing the bulk of the food. Large seeds, as those of the apple or grape and the cherry if taken in a considerable quantity might prove burdensome to the intestine and on this account ought to be discarded. It should be mentioned, however, that the danger which many people apprehend from the entrance of these seeds into the appendix is wholly imaginary. Seeds are sometimes found in a diseased appendix but their presence is purely accidental; they are not the cause of the disease but a consequence. When the appendix becomes diseased in such a way that the valve which guards its mouth no longer operates, remaining open, seeds and other foreign bodies may find their way into the appendix and possibly may thus become a source of injury and danger although the danger from this source must be quite remote.

Grape Seeds

Q. **In eating fresh grapes, should one reject the seeds and skin?**

A. Yes, the skins and seeds of grapes have no nutritive value whatever and should be entirely discarded. In cases in which grapes are not fully ripe, it is well to discard the pulp also. It has little or no nutritive value, and if the digestion is slow, may prove an embarrassment to the stomach.

Fruit Supper

Q. **Is a fruit supper healthful?**

A. There is an old adage to the effect that fruit is golden for breakfast, silver for dinner

and lead for supper. The adage has no foundation in fact. Fruit is golden all the time. It is especially wise to make the last meal of the day almost wholly of fruit. The food principles furnished by fruit are for the most part ready for immediate absorption and require no digestion. Fruit is on this account very little burden to the stomach and may be taken at almost any time without injury. A little ripe fruit taken at bed time, as one or two apples or oranges, is in many cases a valuable means of securing prompt evacuation of the bowels in the morning.

Laxative Fruits and Laxative Drugs

Q. **What is the difference between the effects of laxative fruits and laxative drugs?**

A. Fruit stimulates the intestines to activity through the acids and sugars which they normally contain and which excite the bowel to action without irritating it, whereas laxative drugs are without exception irritants, and when their use is long continued the common result is colitis or chronic infection of the colon. Aloes, epsom salts, cascara sagrada, Seidlitz powders and a long list of laxative drugs are all without exception more or less injurious.

Lemon Juice

Q. **Does lemon juice aid digestion?**

A. Yes, all vegetable acids act as normal stimulants to the stomach and promote the flow of gastric juice. Vegetable acids are especially valuable when the gastric juice contains no acid. In such cases, the fruit acids are able to fill the place of the gastric acid to a slight degree.

Prunes

Q. **Is the free use of prunes to be recommended for laxative effects?**

A. Prunes soaked in water for twenty-four to forty-eight hours and freely eaten have a decided laxative effect. Prunes are much used for this purpose by eminent German physicians. Some experiments made in the laboratory of the Battle Creek Sanitarium some years ago showed that prunes contained so large an amount of benzoic acid that they tend to acidify the urine. This is the only possible objection to their use. When eaten in connection with fresh vegetables in liberal quantities this objection would probably not hold good as the small amount of benzoic acid would be neutralized but if eaten freely in connection with a cereal diet, the urine might be rendered so highly acid as to be decidedly injurious in some cases, especially in cases in which the bladder or kidneys are diseased.

The Orange

The orange is one of Nature's finest gifts to man. Orange juice contains pre-digested food in a most delicious and attractive form ready for immediate absorption and utilization.

The amount of food contained in a single large orange is about equivalent to that found in a half slice of bread but it differs from that of bread in the fact that it needs no digestion while bread, before it can be used in energizing and strengthening the body, must undergo digestion during several hours. It is for this reason that oranges are so refreshing to an ex-

hausted or feeble person. The sweeter the orange the greater its food value.

But the energy value of the orange, which for an ordinary sized orange amounts to about 75-100 calories, is by no means its only value. Orange juice is rich in salts, especially lime and alkaline salts, which counteract the tendency to acidosis which is always threatening sedentary people, hearty meat eaters and those advanced in age. The free use of orange juice is a valuable means of combating the inroads of "Father Time" and is also an excellent means of antidoting to some extent the bad effects of an indoor or sedentary life.

One or two oranges taken at bedtime and on rising in the morning are excellent means of stimulating bowel action. Oranges may be taken between meals with great benefit by feeble persons and those suffering from constipation. The delightful flavor and general stimulating influence of orange juice excites peristaltic activity and so tends to prevent the accumulation of food residues in the colon which leads to putrefaction and autointoxication.

Grapefruit

Q. **When should grapefruit be eaten?**

A. At any time. At breakfast, dinner, supper or between meals. Whenever one feels inclined. Such food does not require any work of the stomach.

When fully ripened, the fruit is sweet enough without sugar. Much sugar added is likely to cause hyperacidity and gastric irritation.

Food Value of Grapefruit

Q. **What is the food value of the grapefruit?**

A. The grape fruit, like other citrus fruits, is chiefly valuable for the sugar and citric acid which it contains. The food value of an ordinary sized grapefruit is 100 calories, or about the same as four ounces of grape juice or five ounces of milk, or a large slice of bread.

Dietetic Value of Acid Fruits

Q. **What are the especial benefits to be derived from acid fruits?**

A. Many people have noticed the marked benefit from the use of acid fruits. The writer has not infrequently been told by persons suffering from dyspeptic disorders that the juice of a lemon taken soon after meals has sometimes given relief. Others have been benefitted by apple juice and others by moderately acid fruits.

The nature of this beneficial effect of fruit was not understood until experiments by Pawlow and others, which demonstrated two things; first, that the acids of fruits stimulate the stomach to produce gastric acid, which is absolutely essential for good digestion; and second, that the acids of fruits are able, to some degree, to take the place of the natural acid of the stomach when this acid is absent.

These facts emphasize the importance of acid fruits, including the tomato—a vegetable-fruit—as an aid to digestion, especially in cases of persons suffering from hypohydrochloria, or achylia,

a condition in which there is deficiency or absence of hydrochloric acid, the normal acid of the gastric juice.

Let us point out that one of the important functions of the hydrochloric acid of the gastric juice is to activate the pepsin; that is, without acid the pepsin is unable to do its work, which consists in the digestion of protein. The addition of hydrochloric acid to pepsin renders it active and efficient, and the acids of fruits have been proved to be to some extent capable of replacing the hydrochloric acid in activating pepsin.

It is thus evident that persons suffering from deficiency of acid or the absence of acid should take care to make acid fruit or fruit juices of some sort a part of every meal. Fruit may be taken both at the beginning of the meal and at the close of it.

Disinfection of Raw Fruits and Vegetables

Q. **Is it dangerous to eat raw fruits and vegetables as they come from the market?**

A. Yes. Raw fruits and vegetables as received from the market are always open to suspicion to being contaminated with bacteria. In fact, this is true of most raw foodstuffs.

All kinds of fresh fruits are infected with germs, yeasts and molds, which speedily develop and destroy the fruit unless prevented from so doing by means of cold storage. These germs may be derived from the garden, soil, the hands of the pickers, the receptacles in which they are transported, in the markets where they are exposed for sale.

In the summer time these germs grow rapidly while the fruit is being transported to market, or while exposed in the market, or after purchase by the consumer.

Thus fruit, eaten without disinfection, may easily become a source of mischief, as germs will grow in the stomach or intestine when swallowed with the food.

In this way the average individual is constantly collecting germs of various sorts and every adult carries in his colon a vast assemblage of bacteria, the so-called intestinal flora.

Such vegetables as lettuce, celery, and radishes, and fruits which like strawberries, grow in, on or near the ground, are liable to carry not only germs but the embryos of various intestinal parasites.

The use as fertilizer, of "night soil," gathered by city scavengers and largely disposed of to gardeners in the neighborhood of large cities, very naturally facilitates the distribution of intestinal parasites of various sorts. Some years ago, Metchnikoff called attention to the danger of infection from this source.

Recent investigations have shown that lettuce, celery, and even some fruits, sometimes become infected with typhoid and other germs through the medium of worms, snails and insects.

The late Ellen H. Richards, of the Massachusetts Institute of Technology, made some years ago a study of the condition of fruit found on open air fruit stands. A pint of various fruits taken at random from a stand were

washed and a bacteriological examination made of the washings. 140,000,000 germs were obtained from this single pint of fruit. Fruit thus exposed to street dust is certain to collect a great number of germs derived from the excreta of animals and other dangerous sources and is quite unfit for food.

These small creatures gather typhoid and other germs from the soil and in crawling over the leaves of vegetables they deposit a trail of germs with fecal matters upon the surfaces which they traverse.

A five per cent solution of dioxogen will destroy the germs without the least impairment of the foods in flavor or any other particular. A large stone jar was half filled with dioxogen solution, one part to twenty of water. In this bath fruit, lettuce, or other food, after thorough washing, is dipped and allowed to remain for five minutes.

At the Battle Creek Sanitarium, dioxogen is in daily use for the disinfection of all fresh, uncooked fruits and vegetables used in the feeding of the great family of 2,000 to 3,000 persons who are served in the several capacious dining rooms of the institution.

Dioxogen is particularly adapted to this use because it is free from the deleterious drugs found in some other peroxide preparations.

This practice of disinfecting all fresh foods will no doubt in due time become general. It is the only means of protection against certain intestinal parasites which are very difficult to dislodge after they once become established in the intestine.

The Curative Properties of Cherries

Q. **Has the cherry any value as a remedy?**

A. Linnaeus, the famous Swedish botanist, who made the first scientific classification of plants, held cherries in especially high esteem. He relates that when suffering from a grave bowel trouble which resisted all remedies, he cured himself by eating freely of cherries for some days in succession, taking little or no other food.

"According to Pliny," says Fernie, "cherries were first brought to Rome by Lucullus after his great victory over Mithridates, 89 B. C. The cultivated cherry disappeared in this country (England) during the Saxon period, and was not re-introduced until the reign of Henry the Eighth.

"Cherry stones have been found in the primitive lake dwellings of Western Switzerland. There is a tradition that Christ gave a cherry to St. Peter, admonishing him not to despise little things.

"In France, soup made from cherries and taken with bread, is the common sustenance of the wood-cutters and charcoal burners of the forest during the winter."

The Loganberry

Q. **How did the loganberry originate?**

A. Judge Logan, of California, discovered the berry nearly forty years ago. It is supposed to be a chance hybrid between the wild blackberry and the red raspberry. It is long and fat, having more substance and juice than any other

berry. It is grown on a commercial scale in California, Washington and Oregon, but does not seem to be adapted to the Eastern climate. It was first used for pie and jam and shipped to Western cities, mostly fresh, and in iced cars, fast freight.

The production is between three and seven tons of loganberry fruit to the acre, which compares closely to the crops yielded by the grape. The yield of juice for the same weight of fruit excels the grape.

If the vines are carefully cultivated, the yield will average from four to five tons of berries to the acre. Growers are paid 3½ cents per pound. The berries are picked in pound hallocks, and are delivered to the juice plants in single tier crates of twenty-four hallocks each.

The Strawberry

Q. **What are the special food qualities of the strawberry?**

A. The strawberry, with its delicious aroma and its delicate sweet-acid flavor, is one of our choicest and most popular fruits. It is at the same time a highly useful and wholesome food. Its high water content reduces its nutritive value below that of most fruits, placing it on a footing with the orange, the muskmelon, string beans and turnips; but it is unusually rich in lime and iron, not only as compared with other fruits but with most other foodstuffs. Here are a few interesting comparisons:

The strawberry contains one-fourth grain of food lime to the ounce, which is more than any other fresh fruits except fresh figs and rasp-

berries. Its lime content is six times as great as that of the apple, five times the banana, four times the tomato and watermelon, and double or more that of the blackberry, blueberry, cherry, cranberry, grape, muskmelon, peach, pear, pineapple and plum. Its lime content is greatly excelled among fruits only by dried fruits, especially figs, dates, currants, raisins and prunes.

The strawberry presents a higher proportion of lime, notwithstanding its large water content, than any cereal food except oatmeal and entire wheat and rye. It affords, in equal weight, five times as much lime as does rice, four times as much as hominy, and three times as much as white bread.

The egg, which is very rich in lime, contains only twice as much iron as does the strawberry, and strange as it may appear, this delicious fruit affords three times as much lime as does white of egg and four times as much as beef or chicken.

The richness of the strawberry in iron is still more noteworthy.

Here are the facts which appear from a critical study of the latest findings of the ablest food chemists:—

With the exception of the raspberry and fresh fig, the strawberry excels all other fresh fruits in richness in food iron. It contains four times as much iron as the orange and nearly three times as much as the grapefruit, three times as much as apples, apricots, cantaloupe, muskmelon, grapes, peaches, pears, watermelon; twice as much as tomatoes and cherries, and

fifty per cent more than raspberries, currants, cranberries, bananas, and blackberries.

A pint of strawberries contain as much food iron as a pound loaf of white bread and one-fourth more than an equal weight of cornmeal. It also contains more iron than an equal weight of beefsteak, and its iron is of better quality.

Strawberries are richer in iron than most fresh vegetables, affording more than celery and lettuce, as much as sweet corn, cauliflower and cabbage, only a little less than string beans, cabbage and brussels sprouts, and one-half more than turnips, squash, radishes, eggplant, carrots, parsnips, beets, onions, and sweet potatoes, and four times as much as cucumbers. It is only excelled as a source of food iron by two vegetables—fresh lima beans and green peas.

The strawberry has an equal value, when freely used, as a protection against the loss of lime or of iron, and it is also invaluable as a source of organic bases which are needed to neutralize the acid wastes of the tissues, thus preventing the development of "acidosis" and its numerous accompanying [illegible]

The Food Value of Fruits

Q. **In general, what is the food value of fruits?**

A. Fruits are valuable chiefly for the sugar, vitamins and acids which they contain. Sugars contains practically no fats and only minute quantities of protein, one-half per cent to one per cent.

The carbohydrates of fruit are chiefly in the

form of sugar, dextrin, and acids, and are ready for immediate absorption.

With a few exceptions, the sugar of fruits is dextrose and levulose, generally in about equal parts. This is the form in which carbohydrates are utilized by the body and hence require no digestion. The absence of fat and the presence of minute quantities of protein, and the fact that the sugar is generally in a form in which it can be immediately assimilated, shows that fruits, of all foodstuffs, tax the digestive organs the least. The nutritive material which they contain is ready for immediate use, and this, perhaps, accounts for the almost immediate refreshing effect experienced by a fatigued person from the drinking of fruit juices, and accounts for the great popularity of fruit juices of all sorts, especially in seasons of the year when the depressing effects of heat are most generally felt.

The following table shows the composition of most of the fruits in common use:

Table Showing the Composition of the Edible Parts of Fruits

	Water	Protein	Carbohydrates	Ash	Cellulose	Acids
Apples	82.5	0.4	12.5	0.4	2.7	1.0
Apples (dried)	36.2	1.4	49.1	1.8	4.9	3.6
Pears	83.9	0.4	11.5	0.4	3.1	0.1
Apricots	85.0	1.1	12.4	0.5		1.0
Peaches	88.8	0.5	5.8	0.6	3.4	0.7
Greengages	80.8	0.4	13.4	0.3	4.1	1.0
Plums	78.4	1.0	14.8	0.5	4.3	1.0
Nectarines	82.9	0.6	15.9	0.6		
Cherries	84.0	0.8	10.0	0.6	3.8	1.0 to 1.5 (Stutzer)
Gooseberries	86.0	0.4	8.9	0.5	2.7	1.5
Currants (red, black and white)	85.2	0.4	7.9	0.5	4.6	1.4
Strawberries	89.1	1.0	6.3	0.7	2.2	1.0 to 1.2
Whortleberries (Blueberries or Bilberries)	76.3	0.7	5.8	0.4	12.2	1.6
Blackberries	88.9	0.9	2.3	0.6	5.2	
Raspberries	84.4	1.0	5.2	0.6	7.4	1.4
Cranberries	86.5	0.5	3.9	0.2	6.2	2.0 to 2.5
Mulberries	84.7	0.3	11.4	0.6	0.9	1.8
Grapes	79.0	1.0	15.5	0.5	2.5	0.5
Melons	89.8	0.7	7.6	0.6	1.0	
Watermelons	92.9	0.3	6.5	0.2		
Bananas	74.0	1.5	22.9	0.9	0.2	
Oranges	86.7	0.9	8.7	0.6	1.5	1.0 to 2.5
Orange juice	85.0		10.8			1.93
Lemons	89.3	1.0	8.3	0.5		
Lemon-juice	90.0		2.0	0.4		7.0 (citric acid)
Pineapples	89.3	0.4	9.7	0.3		
Pomegranates	76.8	1.5	16.8	0.6	2.7	
Dates (dried)	20.8	4.4	65.7	1.5	5.5	
Figs (dried)	20.0	5.5	62.8	2.3	7.3	1.2
Figs (fresh)	79.1	1.5	18.8	0.6		
Prunes (dried)	26.4	2.4	66.2	1.5		2.7
Prunes (fresh)	80.2	0.8	18.5	0.5		
Currants (dried)	27.9	1.2	64.0	2.2	1.7	
Raisins	14.0	2.5	74.7	4.1		
Olives	67.0	2.5	5.7	4.4	3.3	
Rhubarb Stalks	94.4	0.6	2.5	1.1	0.7	

The following table shows the amount of sugar contained in some of the most commonly used fruits, representing practically the total useful carbohydrate content of the fruits named, since the other carbohydrates consist chiefly of vegetable gums which have little or no nutritive value.

Table Showing the Amount of Sugar in Common Fruits

	(Per cent)
Hot-house Grapes	17.26
Preserved Grapes	16.50
Figs (fresh)	11.55
Cherries	10.00
Preserved Pears	8.78
Fresh Pears	7.84
White Currants	6.40
Strawberries	5.86
Preserved Apples	6.25
Raspberries	7.23
Oranges	8.58
Apricots	8.78
Pineapples	13.31
Plums	1.99
Lemons	1.47

Food Acids

Q. **What acids are found in foods, and have they any nutritive value?**

A. The food acids are tartaric, malic, and citric acids. All of these are oxidized, or burned, in the body the same as starch and sugar, although their energy value is only about half that of starch and sugar. These

acids are found in foods for the most part in combination with soda or potash, usually the latter. When taken into the body, the acid parts are oxidized or burned, leaving the base, or alkali, behind. On this account, the effect of these food acids is to increase the alkalinity of the fluids of the body, a matter of much consequence since by this means the acid waste products of the body are neutralized, and the tendency to acidosis always present is overcome.

Citric acid and malic acid appear to be the most easily burned or utilized by the tissues.

Tartaric acid is less readily utilized.

(See *Jour. of Industrial and Engineering Chemistry,* August, 1917.)

Chemical Composition of Food Acids

Q. **What is the chemical composition of the three food acids, malic acid, tartaric acid and citric acid?**

A. Malic acid, the characteristic acid of apples, has the following composition: $C_4 H_7 O_5$. The molecular composition of tartaric acid, the acid of grapes, is $C_4 H_6 O_6$. The composition of citric acid found in lemons and other citrus fruits, is $C_6 H_8 O_7$.

The Acids of Foods

Q. **In what foods are the various food acids present?**

A. "Citric and malic acids are the characteristic acids of fresh fruit juices, excluding grape juice. Succinic acid is found in small quantities in fresh fruit, especially in the unripe condition,

but tartaric acid does not occur in other fruits than grapes. In berries, in general, citric acid predominates and most berries contain, in addition, malic acid in very small quantities. Of the stone fruits, in cherries and plums malic predominates, if it is not present exclusively. The question of the acids of peaches and apricots must be left open, the wide spread assumption that these fruits contain malic acid as the predominating acid being shaken by the researches of Kunz and Adam. In seed fruit, such as the apple and the pear, malic acid predominates or is almost exclusively present, except for tannic acid. The total acidity of berries should, therefore, be expressed as anhydrous (water free) citric acid and of cherries and seed fruits as malic acid."

"Truchon and Martin-Claude report tartaric acid in strawberries, black currants, quinces, apricots, unripe cherries and in traces also in greengage plums. No tartaric acid was found in white currants, pears and apples. They report citric acid in apricots and in faint traces in unripe cherries, although it was not found in ripe cherries. Chauvin, Joulin and Canu state that the acidity of black currants, cherries, quinces, strawberries, raspberries and apricots is due to tartaric acid, while that of red and white currants, Reineclaude, Mirabelle and Orleans plums, pears and apples is due to citric. Muttelet, on the contrary, reports the predominating acid of cherries as malic with no citric and only undeterminable traces of tartaric. He states that strawberries, raspberries and red and

black currants contain citric acid, with traces only of tartaric and no malic. Warcollier found no tartaric acid in either apples or pears. Paris reports the presence of citric acid and a small amount of malic acid in strawberries. He finds no oxalic, tartaric, salicylic or benzoic acids.

"Jörgensen reports malic as the principal acid of cherries. He found no tartaric acid and only found traces of succinic and citric. Roux and Bonis state that malic acid predominates in cherries but report also citric and tartaric acids."

Summarizing, we may say that malic acid is practically the sole acid ingredient of the apple, banana, cherry, peach, pear, persimmon, plum, quince, watermelon. Citric acid is the chief or exclusive acid of the cantaloupe, cranberry, currant, gooseberry, pomegranate, red raspberry.

Tartaric Acid

Q. **In what foods is tartaric acid found?**

A. Tartaric acid is the characteristic acid of grapes. Most authorities maintain that tartaric acid is found in no other fruit except grapes. It is possibly present in small traces in some other fruits, and has been reported present in pineapples. Curiously, it is found in several vegetables, particularly potatoes, carrots, cucumbers and endive.

Malic Acid

Q. **In what foods is malic acid found?**

A. Malic acid, which is the characteristic acid of apples, is also found in many fruits and in a few vegetables. The following list of

foods containing malic acid has been compiled from various sources:

	(Per cent)
Apples	.21 to 1.81
Pears	.11 to .50
Cranberries	.50
Cherry	.56 to 1.54
Banana	
Currants	2.00 to 3.37
Gooseberries	1.7 to 2.6
Plum	.55 to 2.15

Grapes	Spinach
Beets	Lettuce
Beet and other greens	Watermelon
Celery	Tomatoes
Quince	Asparagus
Strawberries	Peach

Citric Acid

Q. **In what food is citric acid found?**

A. Citric acid is the characteristic acid of lemons, and other citrus fruits, but it is at the same time found in many other fruits and some vegetables. The foods containing citric acid are as follows:

Oranges 1 to 2.5%	Strawberries
Grapefruit	Currants
Cherries	Gooseberries
Legumes	Radishes
Limes	Raspberries
Elderberries	Cranberries
Lemons 6 to 9%	Pears
Pomegranates	Tomatoes

Oxalic Acid

Q. **In what foods is oxalic acid found?**

A. Oxalic acid is the characteristic acid of pieplant and sorrel, and is also contained in the following foods:

Dandelion	Asparagus
Spinach	Cress
Endive	

Oxalic acid is not burned or utilized in the body and hence should be excluded from the dietary. Death from oxalic poisoning has followed the use of rhubarb as greens. The small amount of oxalic acid present in spinach and some other greens may be removed by parboiling.

Tannic Acid

Q. **What foods contain tannic acid?**

A. Tannic acid is not found in appreciable amount in any foods except some green leaves which are used as greens. Small traces of tannic acid are found in some fruits. Tea, coffee, cocoa and chocolate contain tannin which is one of the various unwholesome substances found in these beverages.

Acid Content of Apples

Q. **What amount of acid is found in the different varieties of apples?**

A. The following table shows the per cent of acid, practically all malic acid, contained in some of the more common varieties of apples. (Bigelow and Dunbar):

	Per cent of acid (Malic)
Baldwins	.60
Maiden Blush (Green)	1.68
Early Ripe (Green)	1.09
Gravenstein (Green)	1.27
Sweet Bough (Green)	.21
Sweet Bough (Ripe)	.13
Sour apples	.62
Tompkins King	.41
Crab Apple	.78
Northfield Beauty Crab	1.81
Sweet Cider	.40-.56

The Acids of Pears

Q. **What per cent of acid is found in pears?**

A. The per cent of acid found in pears differs with the varieties as does also the kind of acid. Certain varieties contain both malic and citric acids. This is true of the Kieffer, Le Conte, Idaho and Bartlett varieties.

The following table shows the per cent present in several varieties of pears:

	Acid (Malic) Per cent
Kieffer	.50
LeConte	.28
Bartlett	.30
Augonleme	.18
Seckel	.06-.20
Winter Nelis	.11-.25

Lemon Juice versus Vinegar

Q. **Why is lemon juice superior to vinegar?**

A. Lemon juice is superior to vinegar because it is a wholesome food, whereas vinegar is not a food but a poison. Following are some of the objections to the use of vinegar. Vinegar is oxidized only to a very slight extent. The only acids which are fully oxidized are citric and malic acids; tartaric acid is partially oxidized. Oxalic acid and acetic acid behave in the body like mineral acid and are not burned.

Strong vinegar does soften the cellulose of green vegetables, but of what benefit is this? We do not want the cellulose softened. We want it to remain tough and indigestible, so that it may do its work in stimulating the colon. Nobody eats meat so hard that it requires vinegar to soften it, and nobody would think of using vinegar in a quantity sufficient to be of any value whatever in the softening of food. A large amount of vinegar in very concentrated form is necessary to produce any effect of this sort. Taken in such form, the vinegar will soften the stomach as well as the tough meat, and hence would do harm.

Vinegar is an irritant. It has no food value whatever. It is much less palatable than lemon juice, and the fact that it is a preservative is evidence of its anti-vital properties. The same property which renders it a preservative makes it a serious obstacle to digestion.

There is no place for vinegar in a biologic diet. The acid flavor which adds palatability to certain foods is better obtained from lemon juice for the reason that lemons are food while vinegar

is poison. Vinegar, likewise, is of no value as a source of energy. The ancient teaching with reference to the value of vinegar as a food are known by modern physiologists to be entirely wrong. A serious objection to vinegar is the fact that it interferes with salivary digestion. A teaspoonful of vinegar added to an ordinary meal will entirely arrest salivary digestion.

Canned Fruits Without Sugar

Q. **Can peaches and other fruits be successfully canned in Mason glass jars without sugar or other preservative?**

A. Yes. The use of sugar is not at all necessary to the preservation of peaches or other fruits in glass jars. It should be noted, however, that when sugar is not used, it is necessary to cook the fruit at a higher temperature and to prolong the cooking. Ten or fifteen minutes at the boiling temperature, however, is quite sufficient for acid fruits.

Raisins for Constipation

Q. **Are raisins good for constipation?**

A. Yes. Raisins soaked for twenty-four or forty-eight hours and eaten freely at meals are an efficient aid to bowel action. They are hardly equal to purple figs prepared in the same way.

Canned Fruits

Q. **Are canned fruits, such as canned peaches, healthful?**

A. Canned fruits are wholesome when put up in cans which have been properly enameled on the inside of the can so as to prevent action of the acids of the fruit upon lead used in soldering

the cans. At the present time, thanks to the operation of the pure food law canned fruits of all sorts may be eaten with considerable confidence that they are entirely wholesome.

Green Fruit

Q. **Are very green apples, pears, etc., rendered wholesome by cooking?**

A. Very green fruit should not be eaten in any form. Cooking, however, to some extent takes the place of the natural process of ripening.

Is Common Salt Injurious?

Q. **Is common table salt injurious?**

A. Used in small quantities, there is no evidence that table salt is seriously injurious. However, when used in large quantities, it impairs digestion, overworks the kidneys, produces various disorders of nutrition. In certain forms of disease, particularly Bright's disease, cirrhosis of the liver, chronic autointoxication, epilepsy, and in all acute infectious diseases, such as typhoid fever, pneumonia, measles, scarlet fever, etc., chlorid of sodium, or common salt, should be wholly excluded from the dietary. In many cases of dropsy, the swelling of the limbs quickly disappears when salt is wholly excluded from the diet. The experiments made within the last few years in France, Germany, and other countries have shown most conclusively that ordinary vegetable food contains an ample amount of sodium chlorid to supply all the needs of the body.

It is not necessary to add salt to the food. There is sufficient chlorid of sodium in the

food in its natural state. It would be difficult, perhaps impossible, to show that the use of a very small quantity of salt does any material harm; but it is generally agreed by physiologists that the use of salt in the quantities in which it is ordinarily employed is extremely damaging. According to Professor Bunge, perhaps the highest living authority on such questions, the system requires only twenty to thirty grains of salt daily. The majority of people use four or five times as much as this.

The famous Dr. Benjamin Rush wrote more than a century ago:

"Although the interior parts of our continent abound with salt springs, yet I cannot find that the Indians used salt in their diet, till they were instructed to do so by the Europeans."

Common Salt Non-Essential

Q. **Is it necessary to add common salt to food?**

A. Probably not. Although chlorine, one of the constituents of common salt, commonly known as chloride of sodium, is an essential element of the gastric juice, many observations made within the last twelve or fifteen years have shown that common salt can no longer be considered as essential as an article of diet as it has long been supposed to be. Dr. Mendel has observed that animals from whom chloride of sodium was wholly withdrawn continued to thrive and to increase many times their original weight.

Poison in Potato Skins and Sprouts

Q. **Is it true that the sprouts and skins of potatoes contain potato poison?**

A. The potato belongs to a class of poison-producing plants. Solanin, a powerful poison is found in considerable quantity in potato balls and a small amount is sometimes found in the skin of the potato. The amount of solanin in the skin, however, is exceedingly small, except in cases in which a portion of the surface of the potato has been exposed above ground. The skin then has a greenish color and a bitter taste and contains a considerable amount of solanin. Potato sprouts contain a considerable amount of solanin and must be carefully removed when present.

Dietetic Value of the Potato

Q. **What is the food value of the potato compared with that of other roots?**

A. According to *The Journal of Biologic Chemistry,*

"The potato yields considerably less per acre than do most of the common root crops. Carrots and beets usually produce about twice as much dry matter, and turnips and parsnips at least a third more. Nevertheless, the potato, which is an underground stem, has found much greater favor as a human food than any of the root crops mentioned. This has been attributed, and probably correctly to the lack of decided flavor in the potato, which makes it possible to confer palatability upon it by the addition of milk, butter, and cream, salt and pepper, or by frying in fats. All the other edible roots com-

monly used as human foods in America possess pronounced flavors, and thus do not seem to appeal to the appetite when regularly used in the diet. The sweet potato, which has little flavor other than sweetness, is the nearest competitor of the white potato. On teleolgical grounds it might be assumed that the favor in which this tuber is held is the result of some special value which it possesses from a nutritive standpoint, which has been unconsciously recognized by man in the course of his long familiarity with the two types of potatoes."

An interesting research undertaken by Miss Lenna Cooper, Dean of the Battle Creek Sanitarium School of Home Economics, the results of which were published in a paper by Rose and Cooper in the *Journal of Biological Chemistry*, in 1917, is referred to by the above named authorities, who remark that this important research agrees with researches conducted by Hindhede and Thomas in showing that the protein of the potato has a nutritive value much higher than that demonstrated by McCollum and his co-workers in relation to the protein of any other foodstuffs experimented with by them.

Thomas claimed, in fact, that the protein of the potato has a nutritive value more than twice that of wheat. The recent experiments of McCollum seem to indicate that the food value of the protein of the potato is about the same as that of cereal grains.

The experiment showed that the potato may be largely used for a long time without injury, which agrees with the results of Hindhede. It

contains a certain amount of fat-soluble vitamin, but not sufficient fully to meet the demands of satisfactory nutrition.

Q. **Is a diet consisting very largely of potatoes healthful?**

A. Certainly, provided the other part of the diet consists of suitable, complementary foodstuffs. Potatoes contain no fat, and are an insufficient diet without the addition of fat. A man observed by Hindhede lived for more than a year, working at very hard labor, on a diet consisting exclusively of potatoes and fat.

The Copenhagen physiologist has also shown that the potato ash and other alkaline salts of the potato are highly valuable in the elimination of uric acid and other acid wastes from the body. It was noted that in a person living on a potato diet the urine was found capable of dissolving considerable quantities of uric acid, whereas a person living upon a flesh diet, or a diet consisting chiefly of cereals, could dissolve little or no uric acid. On this account Hindhede recommends the free use of potatoes in cases in which there is an accumulation of uric acid in the body, and especially in cases of renal calculi or kidney stones.

The potato is not only an easily digestible foodstuff, but possesses a much higher nutritive value than is generally supposed. According to Gautier, about one-fourth of the weight of the potato is food substance, consisting chiefly (nine elevenths) of starch. Of the remainder, three-fifths are protein, the tissue-building element, and two fifths alkaline salts in combination with citric and malic acids, the acids of the lemon and the apple.

The potato is perhaps slightly deficient in protein, though this statement would be disputed by some physiologists whose experiments appear to demonstrate that the amount of protein contained in the potato is quite sufficient for ordinary bodily needs.

The potato is certainly deficient in fats, of which it contains almost none, because of the fact that it is not, like so many of our vegetable foods, a seed, but a curiously modified and enormously fleshy stem. This deficiency in fat must always be remembered in the use of the potato, and the lack must be made up by the addition of cream, butter, or some other foodstuff rich in fat.

What the potato lacks in fat and protein, however, it makes up in salts, which constitute nearly 5 per cent of its dry substance and are perhaps its most characteristic quality from a dietetic standpoint and one of its chief excellences. These salts consist chiefly of potash, and in the ordinary form in which they are supplied, do a most important service in maintaining the alkaline condition of the blood, which is essential to good health and resistance to disease. The potato is lacking in lime. On this account, "greens" of various sorts, milk, or buttermilk should be used with the potato to supply the needed lime salts.

Iron in Tomatoes

Q. **Is there any iron in tomatoes?**

A. The tomato has long been recognized as an excellent article of food. It is properly known as a vegetable fruit. The tomato is val-

uable not only because of the wholesome vegetable acid which it contains, of which the chief is citric acid, but also on account of the vitamines of which it furnishes a rich supply, and especially its iron content. The value of the tomato as a source of organic iron has not been fully appreciated until recently. The solids of the tomato contain .023% of iron. One pound of tomato contains enough iron to supply the body needs for one day. It is evident then that the tomato is an excellent food for persons suffering from a deficiency of blood or blood coloring matter.

Onions

Q. **Are onions harmful?**

A. Raw onions are objectionable on account of the acrid oil they contain. Cooked properly, this oil is largely driven off. Used thus and as a flavor for soups, the onion is harmless. The onion has also one special virtue. It contains a relatively large amount of very easily assimilable food iron.

Sauer Kraut

Q. **Is sauer kraut healthful?**

A. Sauer kraut is a preparation which has undergone lactic acid fermentation. Sauer kraut furnishes but a very small amount of nutriment, but it is a form of uncooked vegetable food which is of great value to the peasantry of Russia and other parts of northern Europe during the long winter season, where in the absence of fruit and fresh vegetables it constitutes almost the only source of vitamines. The use of sauer kraut could be scarcely recommended when lettuce,

cucumbers, celery and other superior fresh vegetables are obtainable; nevertheless, when fresh and well made, it is a wholesome food. Sauerkraut serves the same purpose in the dietary of the Russian peasant that the ensilage from the silo serves in the feeding of dairy cattle. It might be more largely used in this country with advantage.

Fruit and Vegetable Skins

Q. **Is it harmful to eat the skins of Irish or sweet potatoes or fruits?**

A. Skins of fruits and vegetables contain chiefly cellulose and if finely broken up may be of service as a stimulant to the intestines. Care should be taken, however, that the indigestible material is broken up into minute bits so as to avoid embarrassment to the stomach.

Poisonous Vegetables

Q. **Are vegetables ever poisonous?**

A. Plants sometimes absorb poisons from the earth. Paul Bert raised radishes in water containing solution of strychnia. The radishes accumulated so much that they killed the animals to which they were fed.

Poisonous mushrooms may cause death from the muscarin which they contain.

Certain moulds produce poison, particularly black and orange moulds, which cause vertigo, colic, sweating and even coma symptoms similar to those produced by the muscarin poisons of the mushroom. These poisons are destroyed, however, by oven heat. The green moulds are not poisonous.

Raw Vegetables

Q. **Are raw vegetables, such as potatoes, carrots, cabbages, etc., easily digestible?**

A. The digestible raw vegetables are lettuce, cucumbers, celery, cabbage, green corn, tomatoes; turnips, if well chewed or scraped are also wholesome in the raw state, and for many persons the same may be said of carrots. Potatoes and other vegetables which contain much starch should not be eaten raw. If a person desires to live on a raw diet his staples should consist of fruits and nuts with a good supply of easily digestible vegetables to furnish bulk.

Asparagus

Q. **Is it true that asparagus is unwholesome for persons suffering from rheumatism?**

A. There is no scientific foundation for the popular notion that asparagus must be avoided by rheumatics. Asparagus contains nothing likely to be of any injury in rheumatism or any other disease except, possibly, advanced disease of the kidneys.

Horse Radish

Q. **Is horse radish a wholesome article of food?**

A. Horse radish is not food. This poisonous weed is altogether unwholesome and should never be eaten. Horse radish is highly irritating and caustic.

Celery and Lettuce

Q. What medicinal property in celery and lettuce causes these vegetables to be recommended in a diet for nervous people?

A. Fresh vegetables of all kinds aid bowel action and supply useful vitamines and hormones to the body. Lettuce and celery have no specific medicinal properties.

Pie-plant—Rhubarb

Q. Is pie-plant wholesome?

A. The acid flavor of the pie-plant gives it a fruity taste and if the acid to which its characteristic flavor is due were of the same character as that of acid fruit, it would be not only harmless but a highly useful article of food. Unfortunately, however, the acid of pie-plant is entirely different from that of fruit acids.

There are three acids to which the flavor of sour fruit is due, namely, citric, malic and tartaric acid. Citric acid is the acid of lemons and sour oranges. It is also found in the tomato, the cranberry, the currant and several other fruits. The sour flavor of grapes is due to tartaric acid. All these acids are foods; that is, they are oxidized or burned in the body the same as fruits, sugar and other carbohydrates.

The acid of the pie-plant, however, is an altogether different chemical compound. It is neither citric, malic nor tartaric acid but oxalic acid, a substance, the poisonous and even deadly properties of which are well known.

According to our best authorities, the body

naturally produces and eliminates daily only very minute quantities of oxalic acid—less than one-thirtieth of a grain. In eating a fourth of a pound of rhubarb, one would take into his system four grains of oxalic acid, or more than one hundred and twenty times the amount with which the body is required to deal under natural conditions.

The body is unable to oxidize oxalic acid which consequently passes through the body unchanged like a mineral acid.

The amount of oxalic acid, on account of the highly poisonous character of this substance, is capable of raising the amount of this acid in the body far beyond the point which scientific inquiry has shown to be highly detrimental and productive of disease.

For example, in those morbid conditions in which oxalic acid is supposed to be an active factor, the amount of oxalic acid eliminated through the urine every twenty-four hours is only about double the normal.

That is, oxalic acid is so injurious a substance that, if the amount ordinarily found in the feces is doubled, highly pernicious consequences follow among which are stone in the kidney, stone in the bladder and an extended group of distressing nervous symptoms which are included under the name of oxyluria. In view of these facts, it is evident that by the dietetic use of rhubarb, it is easily possible to increase the amount of oxalic acid from twenty-five to fifty times the amount which clinical observation has shown to be capable of producing grave disease.

Of course, a single dose of pie-plant would produce only temporary effect but the daily use of pie-plant by exposing the tissues constantly to the influence of this poison, must certainly be followed by evil effects, since no one has ever undertaken to show that oxalic acid found in pie-plant is in any way different from oxalic acid derived from other sources.

Used as greens, pie-plant leaves have in several instances produced death from oxalic poisoning.

The Tomato

Q. **What was the origin of the tomato?**

A. The tomato is a native American plant. It was used by the old Aztecs under the name of *tomatl.*

In the sixteenth century, venturesome explorers found in South America the ancestor of the modern tomato, which was called by the Spaniards "tomate," and was valued only for its remarkable red fruit, which led to its use for ornamental purposes. It soon found a place in European gardens and greenhouses as a decorative plant. Certain varieties which produce clusters of round fruit about the size of cherries are still used as ornamental plants. Within the memory of persons now living, the tomato was merely a flower garden curiosity, and was known as the love apple.

For a long time after the tomato began to appear on American tables, it was suspected of being the cause of cancer, though without the slightest ground for such a prejudice, and was avoided by many people on this account.

Steadily the tomato has won its way into popular favor until now there is no garden vegetable so largely and universally used in this country as is the tomato, with the exception of the potato. The same is equally true in Mexico, Italy, and several other countries. The value of the annual crop of tomatoes raised in the United States is $40,000,000, of which fully one-fourth is produced in Florida in the winter and early spring. Texas also produces great crops of this excellent vegetable fruit.

The tomato is perhaps most useful as a relish, but it is also a source of valuable "salts" and vitamins. The acid of the tomato is the same as that of the lemon and the grapefruit,—citric acid.

The tomato contains nearly twice as much iron as does milk, and five times as much as egg white; in fact, it is richer in iron than apples, pears, oranges, grapes, melons, cucumbers and peaches, and contains more than half as much as onions, parsnips, turnips, radishes, sweet potatoes, kohlrabi, eggplant, carrots, celery, cauliflower, chestnuts, beets and bananas. Of lime, the tomato contains more than apples, bananas, rice, rice flakes, and as much as hominy, corn flakes, and egg plant, and more than three times as much as beef, mutton or fish.

The tomato is also rich in the useful potash salts, of which it contains more than most fruits and many other vegetables. More than 12,000 carloads of tomatoes were shipped by rail last year, of which more than half were produced on Florida farms.

Tomato Poisoning

Q. **Is there any foundation for the belief that tomatoes are poisonous?**

A. That an acute eruption on the hands may be caused by poisoning from handling tomato vines, especially when wet with dew or rain, has recently been pointed out by observing physicians. The poisonous properties are confined to the leaves.

This discovery possibly explains the popular belief that the tomato was a poisonous plant, which so long prevented its use. Its cousin, the potato, had been in wide use for more than a century while the tomato was still a garden curiosity known as the "love apple." It was not much eatten until about the middle of the last century.

Fortunately, few persons are susceptible to the poison of the tomato vine. The eruption produced resembles that caused by a slight exposure to "poison ivy" or sumach.

Tomatoes and Rheumatism

Q. **Are tomatoes the cause of rheumatism or cancer?**

A. By no means. Tomatoes are a most wholesome vegetable-fruit. They are especially an excellent source of organic salts which are highly useful in rheumatism as a means of neutralizing acid wastes.

The popular notion that tomatoes may be a cause of cancer has been shown to be utterly fallacious.

The acid flavor of the tomato is due to citric acid.

The tomato is best eaten raw. Fresh tomatoes are a valuable source of vitamines as well as of alkaline salts.

Spinach

Q. **Does spinach contain oxalic acid?**

A. Yes, a little, but the amount is not large, and it has recently been shown that the oxalic acid found in such foods is rendered insoluble in the intestines and so is not absorbed if the amount taken is small. By parboiling, the oxalic acid in spinach is removed.

Sugar

Q. **Is there more than one kind of sugar and does sugar require digestion?**

A. Sugar is a very important food principle, entering into the nutritive processes more largely than any other, for all the starch we eat must be converted into sugar before it can be utilized. Every adult human being uses daily about one pound of sugar.

The chemist is acquainted with many sugars. The following are the principal ones of interest from a dietetic standpoint:—

1. Cane sugar, the ordinary sugar of commerce.
2. Milk sugar found in milk.
3. Fruit sugar (levulose), the sugar of fruits and flowers. Honey consists of fruit sugar mixed with various flavoring substances.
4. Grape sugar (dextrose), the sugar of grapes, also found with levulose in all fruits. A sugar known as glucose, sometimes also grape sugar, is made by a chemical process from corn.

This is not a natural sugar like the sugar of grapes.

5. Maltose, a sugar produced in plants and animals by digestion of starch.

Cane sugar, maltose and milk sugar are identical in chemical composition, but in other characteristics they differ very much. Cane sugar is easily crystallizable, very soluble, and very sweet. Milk sugar has very little sweetness, and is much less soluble than cane sugar. Maltose is not as sweet as cane sugar, but much sweeter than milk sugar.

Milk sugar is easily digested by infants, whose digestive organs produce a large quantity of lactase, the ferment which digests milk sugar. After the age of two years, however, this ferment is greatly diminished in quantity so that milk sugar is less well digested by adults than by infants. The milk sugar of commerce contains great numbers of bacteria, and should never be used without being well sterilized by boiling the solution.

Fruit sugar requires no digestion, being ready for immediate absorption and assimilation.

Cane sugar is not, to any extent, digested in the mouth nor in the stomach, but only in the small intestine, where it comes in contact with the intestinal juice. Several hours elapse after taking a meal before the intestinal fluid becomes able to digest cane sugar and prepare it for absorption. This is not true, however, of maltose, or malt sugar. The digestion of maltose begins at once when it reaches the intestine. The intestinal fluid is always prepared to digest this sugar, because it is natural to the body.

Recent experiments made by the United States government chemists in the investigation of the phenomena of plant growth show that the sugar of fruits is formed from cane sugar by a process of digestion which takes place during the ripening of the fruit, essentially the same as that which occurs in the human intestine. In certain fruits, as some varieties of dates, the digestive ferment is absent, and hence cane sugar is found, the product of imperfect plant digestion.

It is evident, then, that cane sugar is a crude vegetable product not well adapted to human nutrition unless prepared by plant digestion.

As might be expected from its origin, the effect of cane sugar is that of an irritant.

The irritation thus produced by cane sugar gives rise to gastric catarrh, acidity, and various forms of indigestion. Ulcer of the stomach and hyperacidity are doubtless in many cases due to this cause.

The extensive use of candies, preserves, sweets of various sorts, as well as the free use of cane sugar with cereals, in coffee, tea, and in other ways, may be justly held to be the one cause of the indigestion which prevails throughout the civilized world.

Thousands of men, women and children are suffering from disordered conditions of the body, due to the excessive use of cane sugar without being aware of the real cause of their distresses. Not a few intelligent, observing people have discovered that cane sugar is productive of sour stomach and various other gastric disturbances.

It is evident, then, that cane sugar is possessed of properties which are not found in wholesome foodstuffs. No healthy human being suffers because he has eaten a few ounces of bread or potatoes, fruit or nuts. No one suffers from the use of sweet fruit or maltose, an equally natural sugar, native to the body because produced by its own digestive processes.

Honey

Q. **How does honey differ from other sweets?**

A. Honey consists of about equal parts of levulose and dextrine, the two sugars which are found in about the same proportion in many fruits.

In collecting the honey from flowers, bees gather with it more or less of the essential oils to which the perfume of flowers is due, together with pollen-dust and other extraneous matters. But the bee does not simply collect sweet substances from flowers. It works over the material which it collects, in a special digestive system so that when the honey is finally deposited in the "comb" it contains in addition to the several substances mentioned a diastatic ferment resembling that of human saliva which has the power of converting starch into sugar. It also contains a special protein which is excreted by the bee. A recent test for distinguishing between natural and artificial honey makes use of the presence of these secretions of the bee.

It has also been stated that honey contains small quantities of formic acid, a substance de-

rived from the poison bag of the bee and which is introduced into honey to preserve it.

Sugar and Athletics

Q. **Should an athlete eat considerable quantities of sugar?**

A. Sugar may be freely eaten by an athlete with benefit provided it is the right kind of sugar, maltose, lactose, or fruit sugar.

Cane sugar in large quantities produces irritation and congestion. Malt sugar may be taken by athletes with great benefit and its free use is not attended by any unpleasant consequences, such as gastric irritation, hyperacidity, etc., symptoms which frequently appear when cane sugar is freely used.

Beet Sugar

Q. **Is beet sugar as objectionable as cane sugar?**

A. Beet sugar and cane sugar are the same. Cane sugar is found not only in the sugar cane, but in the sap of the maple tree, in the sugar beet and in fact in most vegetables and in some fruits.

Cane Sugar Substitute

Q. **Is there any substitute for cane sugar in preserving or canning fruits?**

A. Fruit can be preserved by canning without the use of cane sugar. Malt sugar or sweet fruits may be added when the fruit is served, or sweet fruit may be cooked with the sour fruit in the canning. Cane sugar does not neutralize the acid of fruits. It simply covers up the acid.

It is better to combine acid with sweet fruits, or to avoid acid fruits altogether if the taste is not agreeable or the effects unpleasant.

Cane Sugar and Gout

Q. **Does cane sugar produce gout?**

A. H. Kionka, having observed that gout occurs in birds and certain other animals as well as in man, undertook a series of experiments upon the common barnyard fowl for the purpose of determining the influence of various substances in producing gout.

He made the interesting discovery that cane-sugar when freely fed to fowls gave rise to gout.

There appears, then, to be good ground for the suspicion which has long existed in the minds of many of the members of the medical profession that cane sugar may be a source of mischief in gout, rheumatism, and even in arteriosclerosis.

There are at present many physicians who forbid the use of cane sugar in these conditions. It will be a comfort to sufferers from these maladies to know that there are other available forms of sugar. Malt sugar is now produced commercially and should displace cane sugar for table use.

Sorghum

Q. **Is sorghum syrup preferable to molasses or cane sugar?**

A. The sugar of sorghum is cane sugar. It differs only from other cane sugars in the fact that it is associated with other substances which impart a peculiar flavor.

When to Avoid Sugar

Q. Who should avoid the use of cane sugar?

A. In certain conditions, cane sugar acts almost as a veritable poison. In the following cases cane sugar must either be wholly discarded, or used only in very minute quantities:

Hyperacidity, hyperpepsia (or hyperhydrochloria) in which an excess of acid is formed by the stomach. Cane sugar greatly aggravates this condition, usually producing pain, distress, heartburn, soreness in the mouth, and sometimes an attack of gastritis often accompanied by vomiting and severe headache.

Catarrh of the stomach, or chronic gastritis, is present in a large proportion of the cases of chronic gastric disease. Many of these cases result from the free use of cane sugar, and hence are aggravated by its use and can not be cured without discarding this article from the bill of fare.

Intestinal catarrh is usually simply an extension of catarrh of the stomach, and is always aggravated by the use of cane sugar and other irritants.

Chronic diarrhea is often the result of the free use of confectionery and sugar in its various forms, and can not be cured unless this irritating food substance is discarded.

Dilatation of the stomach. In cases of this sort cane sugar gives rise to irritating products and often develops enormous quantities of gas, whereby the dilated stomach is still further distended.

Diabetes. The diabetic patient has lost his power to oxidize or burn up sugar, hence must scrupulously avoid cane sugar, the assimilation of which is much more difficult than that of other sugars.

Gout, chronic rheumatism, nervous headache, many forms of neurasthenia, eczema, and other forms of skin disease, apoplexy, and other chronic diseases require entire abstinence from the use of cane sugar or its restriction to the very smallest amount.

Gastric ulcer. In this malady cane sugar gives severe pain at once and greatly aggravates the patient's sufferings. Its use must be wholly discarded.

There can be no doubt that cane sugar, especially in the form of candy, is a cause of serious disease in infants and children. Their digestive organs are naturally more sensitive to injury than those of adults. Maltose and maltose confectionery may be eaten freely by children.

Malt Sugar and Cane Sugar

Q. **What advantages has maltose or malt sugar over cane sugar?**

A. Maltose has the following advantages over cane-sugar:

1. Maltose is a natural product prepared from cereals—natural foodstuffs for human beings.
2. Maltose is naturally formed in the stomach and bowels by digestion.
3. Malt sugar may be absorbed into the blood and assimilated without change in the alimentary canal.

4. Maltose is non-irritating. It is naturally formed in the stomach by the action of the saliva upon starch and hence the stomach is adapted to it.

5. In the process of assimilation, maltose is promptly converted into grape sugar—the sugar of fruits. It presents all the advantages of a fruit sugar with none of the disadvantages of cane sugar.

6. Experiments have shown that maltose is a most powerful antitoxic remedy. When used freely, it diminishes to an enormous extent the growth of putrefactive bacteria in the intestine, and lessens the putridity of the stools, making it a valuable remedy in intestinal autointoxication, commonly known as "biliousness."

7. Still another important advantage offered by maltose over other sugars is the fact that it contains the necessary salts and vitamines for nourishing the bones, brain, and nerves.

Fats

Q. **Of what value are fats and how large an amount of fats should the daily diet contain?**

A. Fats are used as fuel in the body. The amount of fat daily consumed is usually quite small. Nature seems to prefer to store up the fat for use in emergency. It is deposited under the skin between the layers of muscles and serves as a padding about the various vital organs. The fat of the food is stored up in the body in the same form in which it is eaten; that is, it undergoes no essential change in the process of digestion. The fats of the food are

in the intestine converted into soap by the action of the digestive fluids. Soap is soluble in water and in this form the fat is absorbed after the soap is decomposed and the original fat is reconstructed. Thus pork fat is deposited as lard, mutton fat as mutton tallow, beef fat as suet, while such vegetable fats as olive oil and nut oils are deposited as fluid fats, especially nut oils are the most easily digestible of all fats.

The body also forms fat from starch and sugar. The fat formed in this way is different from other fats, having the special characteristics of human fat. From this it would appear ordinarily preferable to take fat in small quantities giving the body an opportunity to manufacture its own fat. Experience shows, however, that digestion and nutrition are best when at least a small quantity of fat is taken with the daily food.

Utilization of Fats

Q. **Is fat completely utilized?**

A. According to Von Noorden, digestible fats, even when taken in large quantities, are almost completely absorbed, the loss being not more than 5%. Olive oil and other vegetable fats are absorbed as readily as butter. Fats which have a high melting point, such as beef and mutton suet are not so perfectly utilized as fats at a low melting point. Fats having a melting point above 122° F. are practically not absorbed at all. Fats having a melting point below 109° F. are generally readily absorbed. Various oily substances such as lanoline and paraffin have some of the properties of fat, but really

are not fats. These, according to Munk and Hansen, are not absorbed.

Sterilized Cream

Q. **Is it advisable to eat sterilized cream instead of butter in cases of intestinal catarrh?**

A. Emulsified fat is more easily digested, both in the stomach and in the intestine than clear fat. However, there are certain persons who are unable to eat cow's milk in any form without unpleasant effects. In such cases, butter agrees better than cream. Butter in such cases may be more readily utilized if mixed with cereals, as in the form of a gravy, provided care is taken to avoid excessive heating, whereby the butter fat is decomposed and converted into irritating substances.

Nut Oils

Q. **Are nut oils a wholesome substitute for butter?**

A. Nut oils are more digestible than butter or other animal fats and have the further advantage that in their use there is no danger of infection from tubercle and other disease producing germs. When prepared from fresh material, nut oils are a most wholesome source of fat.

Oils which are prepared from rancid cocoanuts by chemical refining processes can hardly be regarded as wholesome food.

Freshly prepared nut oils resemble butter more closely in chemical composition than do other fats.

The oils also have the further advantage

that, like butter, they are rich in vitamines. The refined fats which are now much used for butter substitutes are wholly lacking in vitamines, the great importance of which has been demonstrated by recent experiments. The average diet is already so deficient in vitamines it is important to avoid adding to the bill of fare any other substances which fail to provide this important food element.

Peanut Oil

Q. **Do you regard oil made from peanuts as wholesome?**

A. Yes. Peanut oil is a wholesome food providing it is good oil. If the oil is rancid, then it is of course unwholesome. Peanut oil is a little more digestible than olive oil and is perhaps better for people who suffer from hypopepsia than olive oil because olive oil of all substances known, lessens the activities of the stomach in producing gastric juice.

Olive Oil and Other Oils as Foods for Fattening

Q. **Is olive oil fattening?**

A. Olive oil and other oils are fattening when taken in sufficient quantity. To produce fattening effects, however, it is necessary that the oil should be taken as an addition to a full diet, that is, a diet sufficient in quantity to supply the needs of the body without the oil. When taken in this way practically all of the oil eaten will be deposited as fat and thus will produce a definite gain in weight.

Sterilized Butter

Q. **Can sterilized butter be made from sour cream? If so, how?**

A. Cream should be sterilized by boiling for fifteen or twenty minutes while still sweet. It may afterwards be soured, if desired, by the addition of a little sour milk or sour buttermilk to the cream, which should be allowed to stand in a moderately warm place over night. The purpose of sterilizing butter is not to prevent souring, as the germs which produce acidity do no harm, but to destroy tubercle germs, colon germs, and other injurious organisms.

Butter

Q. **Is ordinary commercial butter a wholesome article of food?**

A. The conditions under which commercial butter is produced are often such as to render it exceedingly unwholesome. Commercial butter contains bacteria in great variety and in prodigious numbers. It is not uncommon to find one to fifty million germs in a teaspoonful of milk.

Butter, unless made from sterilized milk, contains germs in great quantities; even the germs of tuberculosis and typhoid fever have been found in butter which had been made several weeks. Rancid butter is highly injurious, not only because of the germs which it contains, but because of the unwholesome effect of butyric acid present. Pawlow has shown that this acid irritates the stomach in such a way as to cause it to produce an excess of acid. On this account it is especially important that persons suffering from gastric hyperacidity and diabetes

should avoid the use of butter which has the slightest taint.

Malted Nuts

Q. **What is the composition of this preparation?**

A. Malted nuts consists of a combination of nuts and malt digested cereals in about equal parts. It is an easily digestible foodstuff which has been prepared especially to meet the needs of persons who cannot use milk or cream without unpleasant effects. When diluted with water in the proportion of about one part to seven Malted Nuts constitute a food somewhat resembling that of mother's milk. When such a mixture is added to an equal quantity of cow's milk it modifies the latter in a way which increases its digestibility. Malted Nuts has been found useful in the feeding of infants who do not tolerate cow's milk.

Malted Nuts possess the extraordinary property of stimulating the flow of milk in nursing mothers and improves the quality of the milk and the health of the mothers as well as of their infants.

The Food Value of Nuts

Q. **What is the food value of nuts?**

A. Nuts are the most highly concentrated of all natural foods. For example, a pound of almonds contains as much protein as a pound and a half of meat, as much fat as two-thirds of a pound of butter, besides some carbohydrate. With the exception of fats and oils there are no natural foodstuffs which compare in nutritive value with nuts.

The Digestibility of Nuts

Q. **What nuts are most easily digestible?**

A. All nuts are easily digestible if well chewed.

It is best to remove the skins and crush them by passing through a mill of some sort. A mill that divides into small bits without crushing into a paste is, however, worse than none, as the small particles cannot be easily chewed, and are likely to be swallowed without thorough mastication.

The nuts must be reduced to a fine paste to be easily digested.

Cotton-Seed Oil

Q. **Is cotton-seed oil poisonous?**

A. It has long been known that cottonseed and cottonseed oil cake produce toxic effects when fed to animals in more than very small amounts. After a very exhaustive research for the cause of these poisonous effects, it has finally resulted in the discovery of the objectionable substance, which is known as *gossypol.* The presence of this poison is readily shown by sprinkling the meal in a thin layer on a glass slide and then touching it with strong sulphuric acid. Examination with the microscope will show numerous red spots if gossypol is present in a large amount.

Carruth, of the North Carolina Agricultural Experiment Station, by whose authority the above statement is made, states that the poison gossypol is "entirely removed in the refining process."

It appears, moreover, that even the crude oil contains very little gossypol, the poison remaining behind in the pressed meal.

Olive Oil Not Laxative

Q. **Is olive oil a wholesome laxative, and is it better than white Russian oil?**

A. Olive oil is a wholesome food, when taken in moderate quantity. In a few cases, a tablespoonful of olive oil taken before each meal acts as a laxative, though generally the amount of olive oil which can be safely taken is not sufficient to produce definite laxative effects. When taken in large quantities, olive oil, like other fats, promotes intestinal putrefaction, though olive oil is less objectionable than animal fats. Specially refined white Russian paraffin oil produces an excellent laxative effect, in quantities of one or two tablespoonsful taken fifteen to thirty minutes before each meal. Olive oil is digested and absorbed, and it is for this reason that it does not produce marked laxative effects. Paraffin oil is not a fat and is not digested and hence is not absorbed. Its action is purely mechanical, its effect being that of a lubricant.

Fat and Biliousness

Q. **If the use of fats makes a person bilious would the exclusion of fats from the diet be harmful?**

A. Fat should not be entirely excluded from the dietary. A certain amount of fat is necessary for good nutrition; at least one ounce a day. Many persons who cannot use fat in the

form of cream are able to take sterilized butter or olive oil without inconvenience.

Tropical Fats

Q. **Where do the natives of the tropics get their fat?**

A. The natives of he tropics find an abundance of oil in the cocoanut, the olive, palm seeds, and various other tropical fruits.

Fat Ration

Q. **How many ounces of butter fat should one eat daily, provided no other fats are taken?**

A. The average person may consume two and a half to three ounces of butter fat daily, providing no other fat is taken. Persons who suffer distress from acid formation in the stomach may often use more fat with advantage. Persons whose stomachs do not produce a sufficient amount of hydrochloric acid should avoid the excessive use of fat. In such cases two ounces of fat a day may be as much as can be digested. A larger amount may give rise to so-called biliousness.

Nuts for Nursing Mothers

Q. **Is there any food which a nursing mother may eat which will increase the flow of milk?**

A. Yes. Experiments by Dr. Hoobler, of Detroit, in the Woman's Hospital, with lying-in mothers, shows that the amount of milk is very markedly increased on a diet consisting largely of nuts, and that the quality of the milk is increased still more.

The nut diet was compared with a variety of other diets, including meat, eggs, and cows' milk, in connection with ordinary foods. The tests showed that nuts are superior not only to milk, meat or eggs but to all of these foods together, in combination with ordinary foodstuffs. It appears from these experiments that nut protein is superior to other foods for nursing mothers. In Dr. Hoobler's experiments, the nuts were largely used in the form of Malted Nuts and Protose.

Observations made by Hoobler and others have shown that malted nuts is an exceedingly valuable food for nursing mothers. Both the mothers and the infants thrive on this diet surprisingly well. Nuts and nut preparations seem to possess the property of stimulating the flow of milk to an extraordinary degree. This is probably in part due to the fact that the protein of nuts is a complete protein, and hence easily convertible into proteins of milk.

The Jordan Almond

Q. **How did the Jordan almond get its name?**

A. The choicest of all the almonds is the Jordan almond. It is a long, fat nut, sweet and free from "bitters." The general and very natural supposition has been that the Jordan almond got its name from the fact that it came originally from the valley of the curious Jordan river, a stream which runs its course below the level of the sea and finally ends in that strange body of water, the Dead sea, fifteen hundred feet below sea level.

But this is not the correct derivation of the name. According to an English writer, the name Jordan is a corruption of the word "jardyne" or garden, applied to it because it was a cultivated variety in contrast with the wild or "bitter" almond, which contains a poisonous volatile acid.

The Jordan almond came chiefly from Malaga, where it is still much grown in fields and gardens, rather than from Syria.

Almond Milk

Q. **Is it possible to prepare a substitute for milk from vegetables?**

A. Yes. Several vegetable preparations have been devised which possess many of the excellent properties of milk, and may be used as a substitute temporarily, or even permanently, under certain conditions.

Almond milk is quite easily prepared by first blanching them and grinding the almonds and adding twice the weight of water, allowing the mixture to stand over night and then straining through four thicknesses of gauze. Water may then be added to dilute to the consistency of milk or thin cream. From a half pound of almonds a pint and a half of very palatable milk may be obtained.

According to Drs. Chapin and Kast: "Almond milk possesses certain advantages. It ferments much less easily than ordinary cow's milk; it has a higher fat ratio in the form of almond oil, which is sufficiently emulsified to render it easily digestible; the proteins contained in this milk are much less apt to undergo putrefaction than in

the casein of cow's milk; almond milk contains a large amount of phosphorus and a small quantity of sodium chloride, which would suggest its favorable employment in such conditions as rickets and nephritis; from its low carbohydrate content it will readily be seen that it is much less likely to cause sugar fermentation.

This preparation is rich in vitamins. While we do not recommend its permanent use, it is desirable and useful as a temporary substitute, and has served a good purpose in such conditions as nephritis, typhoid, intestinal putrefaction, malnutrition, and secondary anemia."

The writer has made large use of almond milk for thirty years. It is more easily prepared from almond butter than by the method above described. Almond butter already prepared for use may be obtained of dealers in fine groceries in many of the large cities.

Almond butter is simply a paste made by blanching and afterwards crushing the almonds in a powerful mill until a smooth paste is produced. It is only necessary to add water to this paste to produce at once a delightful milk, or cream, which only needs the addition of a little sugar to make it a very delicious substitute for ordinary milk, not only in nutritive properties, but in appearance as well. It has a rich, nutty flavor for which one easily acquires a great relish.

Almond milk is very useful for diabetics and for infants with whom cow's milk does not agree.

Almost equally good milk preparations may be made from the soy bean and the peanut.

Peanut Protein

Q. **Is the protein of the peanut equal to that of meat or eggs?**

A. The peanut ranks very high as a food producer. Until recent years its value has been little appreciated, but the humble peanut is rapidly rising in public favor. In the future it will each year make a larger showing in the crop reports.

A discovery made quite recently in relation to the peanut is likely to add greatly to its prestige as a human food and ultimately will, without doubt, placed it among the great food staples of the country.

In North China and various other countries, where the peanut flourishes, it has long held a prominent place in the national dietary; but in this country its great value has been so little appreciated that it has been scarcely recognized as a food, having been eaten as a dainty or luxury.

Although, since the writer—some twenty-five years ago—introduced the crushed nuts, or peanut butter, into the bill of fare of the Battle-Creek Sanitarium, the use of the peanut in this form has rapidly extended and it has found its way to many thousands of tables.

A discovery, which has really placed the peanut upon a high pedestal among foodstuffs of the finest quality, has yet to be mentioned. It is the fact that the protein of the peanut belongs to a special class very rare among the products of the vegetable kingdom, known to the chemist as "complete protein."

The complete protein is one which contains all the elements needed for making any of the many different kinds of tissue found in the human body. Very naturally these proteins are found in eggs, milk and meat, but they are not found in cereals or vegetables. It has been known for some time that complete proteins were found in the almond and a few other choice nuts, but it is now known that the peanut, together with its cousin the soy bean, contains proteins of the very finest quality.

Roasted Peanuts

Q. **Which is the more easily digestible, roasted or raw peanuts?**

A. To be easily digested peanuts should not be eaten raw nor should they be eaten roasted. If the nuts are slightly baked they will be more easily digested than raw, but if they are roasted until they are brown and bitter, fried in their own fats as it were, they are quite indigestible.

Why Cook Peanuts

Q. **Why is it necessary to cook peanuts to prepare them for digestion?**

A. Peanuts are more closely allied to beans than to nuts. Botanically, they are not nuts at all; they are legumes. They obtain a small amount of starch but a considerable amount of woody matter which needs to be softened by cooking so as to render the albumin and fat accessible to the digestive fluids.

The Soy Bean

Q. **In what respect is the soy bean superior to the navy bean and other varieties?**

A. The soy bean is a very extraordinary vegetable product. Although it grows in a pod, it is, like the peanut, in composition very much like a nut; and, like the almond, its protein belongs to the class known as complete proteins, and closely resembles casein, the protein of milk. It differs from the ordinary bean in containing a very large amount of wholesome, easily digestible oil.

The protein of the ordinary bean is very inferior in character, being so incomplete that only a small percentage is utilized unless eaten in connection with milk or some other food supplying a complete protein.

The soy bean also differs from the ordinary bean in containing a large amount of wholesome and easily digestible fat. The ordinary bean contains very little fat.

Because of these special properties, the soy bean is capable of fully supplying the place of lean meat, milk or eggs. It is for this reason that the Chinese and Japanese are able to prepare from the soy a very good substitute for milk. A very fine cheese is also made from the soy which is in many respects superior to ordinary cheese.

The fat or oil of the soy is of excellent flavor and is more easily digestible than animal fats.

The soy is a vigorous grower and produces more bushels to the acre than does the ordinary bean. Pound for pound the soy bean supplies

one-half more nutriment, so that a parcel of ground planted to the soy bean, supplies one-half more nutriment than if planted with ordinary beans.

The soy bean is very largely used in China and Japan, where it takes the place of both meat and milk, but it is seldom eaten in the way in which the ordinary beans are eaten in this country. The soy bean is chiefly eaten by the Orientals in the form of tofu, a sort of cheese much resembling milk curd. It is also used in the preparation of soy sauce, and as a green vegetable—shelled beans.

The envelope of the soy bean is so tough it is not sufficiently softened by ordinary cooking, but by cooking under pressure, the soy bean becomes remarkably tender and toothsome. A temperature of about 225° F. is required and the cooking must be continued for four to six hours.

Experiments have also been made for the purpose of devising some simple method by which pressure cooking may be done in any kitchen and without expensive or elaborate apparatus. This effort was also most successful. Here is the method which is simplicity itself.

Soak the beans over night in sufficient water to cover them. Provide an empty stone jar with a tight fitting top, also prepare a strong brine by adding to a gallon of water five pounds of common salt. Put the soaked beans in the stone jar with a little salt, adding tomato sauce if desired. Screw on the top, taking care to make it tight. Immerse the jar in the brine and boil for five to six hours. The brine has a boiling tem-

perature of about 225° F. Higher temperatures may be obtained by adding chloride of calcium to the brine.

Prepared in this way, the soy bean makes an exceedingly rich and savory dish with a meaty taste and very great staying and satisfying qualities.

Soy Bean Curd—To-Fu

Q. **What is soy bean curd or cheese, and how is it made?**

A. This interesting product is prepared from the soy bean and is a staple food in China and Japan. It is the chief way in which the soy bean is utilized for human food. The method of making to-fu is as follows:

Add sufficient water to soy bean meal to moisten it. Soak one hour. Add five times the bulk of boiling water.

Boil ten minutes. Strain through a very fine cloth.

This filtrate is soy milk and has a composition much resembling that of cow's milk.

Boil the filtrate and while it is boiling add magnesia chloride solution. Citric acid may be used in place of magnesia chloride with equally good results. This causes the curd to separate. Strain through a colander or seive to separate the curds. Wash two or three times with water to remove the curdling solution.

Curdling solution. Disolve in a pint of water 40 grains of magnesia chloride or of citric acid. To separate the curd, add to the boiling soy milk one part of the solution to five parts of milk.

The composition of to-fu is much like that of fat meat. It is about two-thirds water, 20% protein and 8% fat. A mere trace of starch.

Food Value of the Soy Bean

Q. What is the food value of the soy bean?

A. The soy bean is rich in fat, containing twenty times as much fat as the navy bean. It is also rich in protein, of which it contains fifty per cent more than the same weight of meat. The protein of the soy closely resembles that of milk, being a "complete" protein and capable of replacing the protein of eggs, meat or milk. This has been demonstrated by animal feeding experiments.

A milk closely resembling cow's milk may be prepared from the soy bean, and also cheese.

The soy is rich in vitamines and salts. It contains practically no starch which gives it great value in the feeding of diabetics.

In composition the soy bean much resembles the peanut. It contains more protein (about 40 per cent) and less fat (20 per cent).

In China and Japan the soy is used only in the form of *to-fu,* or curd. There are more than a thousand varieties of the bean. Some are used only for oil or for feeding animals. The half-grown beans, of certain varieties are very delicious. The ordinary yellow bean is very palatable when cooked under pressure at a temperature of 225° F.

The Black Walnut

Q. **What is the value of the black walnut as a food tree?**

A. The black walnut is in great demand at the present time for the valuable timber. The tree is also a source of highly valuable food. The walnut contains half its weight of an easily digestible oil and more protein than the choicest beefsteak. It is a pity to sacrifice a food tree even if its timber is almost worth its weight in silver.

Dr. Robert Morris, one of the most eminent surgeons of New York City, an expert in nut culture as well as in surgery, calls attention in *American Forestry* to the fact that black walnut trees "should be cut between the months of September and April. If the trees are cut at other times of the year the root dies. It is a very important matter to leave living roots which will reproduce the trees rapidly. It is not only a question of future timber supply, but the nut growers are at the present time making special effort to locate black walnut trees bearing particularly thin-shelled and well flavored black walnuts with good cleavage.

"The black walnut is destined to play a large part in our agricultural economics, both as a timber tree and as a source of important food supply. For that reason special effort should be made to avoid summer cutting."

A walnut tree ten years old will produce annually one hundred pounds of nuts, which shelled will give forty pounds of nut meats. A pound of walnut meats affords more than 3,000 calories of food, a sufficient day's ration for a

hard working man. Half of the weight of the walnut consists of palatable and easily digestible fat, superior to any animal fat, and about one-third consists of a fine quality of protein.

Ten million acres of our wild lands, not used for any other purpose, used for walnuts would supply the country with more fat and protein than our entire animal industry, and at no expense for cultivation or fertilizer.

Nuts as Human Food

Q. **Are nuts good foods?**

A. Yes. Cuvier, and many other naturalists, have pointed out the fact that nuts must have been a staple diet of primitive man, as it still is of the man-like apes which inhabit certain regions of the tropics.

For nearly half a century, the writer has earnestly advocated the larger use of nuts in the dietary of man. Nearly thirty years ago, in an effort to overcome the popular prejudice against the use of nuts on account of their supposed indigestibility, we prepared a nut paste by blanching and crushing nuts, to which we gave the name of "nut butter." The peanut was found to lend itself particularly well to this purpose, and soon became quite popular; and today peanut butter is to be found on every grocer's shelves. Excellent butters are also prepared from almonds and filberts.

Various other products were also developed which have come more or less into extensive use, both in this country and Europe. It must be confessed, however, that none of these are really superior to the original products which Nature

prepares ready for our use, without the aid of any culinary process and requiring only to be made into a smooth paste by thorough mastication.

In recent years physiologists and chemists have given considerable attention to the study of the nutritive properties of nuts. A year or two ago, Prof. Cajori, of the Yale University Laboratory, conducted a very interesting research on nuts in the laboratory of the Battle Creek Sanitarium, the results of which were summed up as follows by the *Journal of the American Medical Association,* pages 8 and 9, January, 1919:

"The exigencies of war time have emphasized anew those properties of nuts as foods which remove them from the category of luxuries and place them on the list of substantial components of the day's ration. In considering to what extent nuts may actually be regarded as a good dietary investment, it should be remembered that, compared bulk for bulk, they belong among the most nutritive of foods ordinarily available. They differ from the staple cereal seeds used as human foods in their comparative richness in protein and fat; of the commonly available nuts, the chestnut alone contains an abundance of carbohydrate, starch, in place of the nutrients mentioned.

"The reputation of nuts as desirable dietary components has suffered from the widespread belief that these foods are particularly difficult of digestion. Professor Jaffa of the University of California, who has furnished some of the best experimentally ascertained facts regarding

the utilization of nuts, has remarked that if the true composition of these products were more generally appreciated and their appetizing qualities and food value better understood, they would lose their reputation for being indigestible.

"The view derives added support from the more recent studies of Cajori at the Yale laboratory of physiologic chemistry. In digestion trials on man with almonds, peanuts, pecan nuts, pine nuts, English walnuts, cocoanuts, lichi nuts and Brazil nuts, the 'coefficients of digestibility, for diets including liberal allowances of these components fell essentially within the range of the basal mixed diet of the same persons. In general, says Cajori, the proteins, that is, nitrogenous components and carbohydrates of the nuts studied were absorbed in large part; and in no case did the quantity of nitrogen or carbohydrate appearing in the feces indicate that these nuts are especially resistant to the digestive functions of the alimentary canal. This conclusion is especially emphasized when the nuts are fed in a finely divided form as nut paste or 'butters.' Here comminution is artificially obtained in a degree reached only by the most careful mastication.

"In view of the growing popularity of so-called nut pastes or nut 'butters,' it is interesting to note, in Cajori's findings, the difference of digestibility between the peanut, fed as the whole nut and masticated, and peanut butter. The somewhat more favorable outcome with the latter suggests that the texture of the nut product finding its way into the stomach may not be without effect on the digestibility.

"According to Cajori, it is doubtful whether cooking causes any marked change in the digestibility of protein-rich nuts. The raw almond appeared to be as completely utilized as the thoroughly steamed nut. In the case of the chestnut, with its abundance of starch, such culinary treatment is essential, as it is in the case of the somewhat comparable potato.

"We have already directed attention to Hoobler's assertion that nut proteins may be the equal of animal proteins and superior to others of vegetable origin as components suitable for the elaboration of milk in the diets of lactating mothers. Cajori's studies lead him to the conclusion that if nuts are eaten properly and used in the diet as are eggs, meats and other foods rich in protein, they have a physiological value at par with that of more staple articles of the diet. In harmony with this is the conclusion of the latest pronouncement of the experts of the U. S. Food Administration, pointing out that nuts should be counted as part of the necessary food and not eaten as an extra. We are led to believe that the occasional indigestion following injudicious eating of cheese and nuts is probably often due to forgetting that they are very substantial foods and eating them at the end of an already sufficient meal.

"There are abundant indications that nuts, which have long found a valued place in the dietary of the diabetic without detriment to his health, will grow in popularity as foods for the well. The acreage of peanuts—legumes usually classed with nuts and forming the most valuable

nut crop of the United States—increased 60 per cent last year. A few years ago the importations of other nuts had already approached 100,000,000 pounds a year. This speaks promisingly for the progress of these meat substitutes."

Cocoa

Q. **Is cocoa a healthy beverage?**

A. John Phillips Street, chemist of the Connecticut Agricultural Experiment Station, at New Haven, has the following to say in *The Modern Hospital* respecting the various widely advertised brands of cocoa.

"Cocoa is not commonly adulterated at the present time, and it is unfortunate that many manufacturers still feel that they must resort to exaggeration and misrepresentation in order to sell their product. Without mentioning the specific brands, the following false claims were found on the labels of certain cocoas listed in our tables:—

" 'Owing to the removal of oil, it is certainly the most nutritious and wholesome cocoa now manufactured in the world.' As a matter of fact, this brand contained more oil than most of the cocoas analyzed, and it is by no means the 'most nutritious.'

" 'Triple the strength of cocoa as usually prepared. Preserving in their entirety the nutritive properties of the natural bean.' Both statements are obviously untrue.

" 'Acknowledged by the leading authorities to be absolutely the purest cocoa made.' This is untrue, as it contains a large excess of added alkali.

" 'Soluble and digestible.' Both statements are incorrect.

" 'Cocoa is stronger and more economical than chocolate,' the reverse of which is, of course, true.

" 'Soluble,' 'most of the cocoa-butter has been eliminated,' 'free from alkali.' This cocoa is not soluble, it contains more cocoa-butter than most brands, and it contains free alkali, showing that all three claims are false.

" 'Milk cocoa.' The Reichert-Meissl number indicates the presence of no milk fat.

" 'Instantly soluble in hot water,' 'perfectly digestible,' 'unrivaled as a brain and nerve-food.' These statements are all false and misleading."

All cocoa contains theobromin, a nerve poison.

Chocolate Drinking

Q. **Will the drinking of one or two cups of cocoa daily do harm?**

A. Chocolate and cocoa are altogether unwholesome, and if freely indulged in may easily induce conditions which might readily be attributed to some nervous disorder.

The objectionable feature of cocoa and chocolate is the theobromine which these preparations contain. Theobromine is closely related to caffeine and is essentially the same substance, causing the same evil effects in the body. It is true that the amount of the objectionable element in chocolate is much smaller than in tea and coffee, but the quantity is sufficient to produce very decided effects in susceptible persons.

Preparations of cocoa from which the theobromine has been removed are obtainable.

Soda-Fountain Drinks

Q. **Are soda-fountain drinks harmful?**

A. Some of them are very harmful and particularly coca-cola and other similar preparations. If they do not contain kola, they contain caffein, which is worse. The mixtures of ice cream with various syrups now in fashion are decidedly unwholesome.

Grape Juice

Q. **What are the special virtues of grape juice?**

A. Grape juice possesses the same valuable properties as all fruit juices. Fruit juices stimulate appetite, aid digestion, encourage bowel action and furnish the body with very precious food elements, the so-called vitamines, which are of great value in promoting healthy nutrition.

Fruit Juices Combat Germs

Q. **Will fruit juices destroy germs?**

A. Careful experiments have been made with various fruit juices for the purpose of determining their ability to destroy disease germs, especially the germs of typhoid fever and cholera. Kitasato and Van Ermengen have shown that citric acid in from one-third to one-half of one per cent, that is, one part to two hundred, is capable of killing cholera germs in one-half hour; one to two hundred kills typhoid fever germs, after several hours' exposure. Malic acid —the acid of apples and many other fruits—has been shown to be equally as active as citric acid in destroying germs. It must be added, however,

that it is not safe to trust to a few drops of fruit juice to render bad water safe. Such water must be boiled.

Unfermented Grape Juice

Q. **How is grape juice prepared?**

A. The *Farmers' Bulletin,* No. 176, issued by the United States Department of Agriculture, gives the following method for putting up unfermented grape juice, a supply of which should be kept in every household:—

"Use only clean, sound, well-ripened, but not overripe grapes. The grapes may be crushed and pressed in a portable cider or wine mill or by hand. These can be put in a cleanly washed cloth sack and hung up, or the sack can be twisted by hand until the juice is expressed. The juice should be gradually heated in a double boiler or a large stone jar in a pan of hot water, so that it does not come in direct contact with the fire, at a temperature of 108° to 200° F. If there is no thermometer at hand, heat the juice until it steams, but do not allow it to boil. Put it in a glass or enameled vessel to settle for twenty-four hours; carefully drain the juice from the sediment and run it through several thicknesses of clean flannel; or a conic filter made from woolen cloth or felt may be used. This filter is fixed to a hoop which can be suspended whenever necessary. Fill into perfectly clean bottles (leaving a little space at the top for the liquid to expand when heated). Fit a thin board over the bottom of an ordinary wash boiler, set the filled bottles (ordinary fruit jars of glass are just as good) in it, fill with water

around the bottles to within about an inch of the tops, and gradually heat until it is about to simmer. Then take the bottles out and cork or seal immediately. Grape juice prepared in this way will keep perfectly fresh for an indefinite length of time, and will always be ready for immediate use."

Sweet Cider

Q. **Is sweet cider wholesome?**

A. Unfermented apple juice is exceedingly wholesome. The agreeable acid flavor is due to malic acid, which is an excellent antiseptic or disinfectant for the stomach and bowels. It is a very highly valuable remedy in gastric and intestinal catarrh, so-called biliousness, jaundice, constipation, and in all cases in which the kidneys and the liver are disordered; in emaciation, loss of appetite, and general malnutrition. It can be taken in quantities of one quart daily with advantage. The best times for taking are one-half hour before each meal and just before retiring at night.

Water at Meals

Q. **Is it injurious to drink freely at meals?**

A. To drink or not to drink with meals is a question which has been discussed pro and con for many years. Rovighi has submitted the question to the test of careful laboratory experiments, and has shown conclusively that the free use of liquids with meals increases to a very great extent the putrefaction of the albumins in the intestine, and consequently tends to produce autointoxication, since putrefaction is accompanied by the development of various poisons

which are absorbed from the intestine and circulated in the blood to the detriment of the liver, kidneys, and every other vital organ. Rovighi showed that after a meal taken with a large amount of liquid the urine contained four times as much putrefaction products as before, whereas when the meal was eaten dry the amount of poisons was less than half as much. Schumann, another physiologist, has repeated these experiments and with similar results. Combe, one of the foremost of European specialists in gastric disorders, confirms these results and requires his patients to eat their food dry, taking considerable liquid two or three hours after breakfast and after the mid-day meal, and just before retiring.

The above highly important facts seem not to be known to some recent investigators who recommend water drinking because it increases the production of gastric juice. This is not new. Pawlow showed the same twenty years ago. Water should be taken sparingly at meals, but need not be wholly excluded.

The best time for water drinking is an hour before meals . This plan aids in the disinfection of the stomach in preparation for the next meal, which is essential to good digestion.

Water Drinking Washes the Blood

Q. **Should one drink when not thirsty?**

A. It is not true that water dilutes the blood, at least to any extent. Absorption of fluid from the alimentary canal and elimination through the kidneys take place simultaneously. The water is eliminated practically as fast as it is absorbed,

so that the effect of water drinking is not to dilute the blood, but simply to wash it. In persons who do not drink a sufficient amount, and especially in those who make large use of flesh foods, the blood becomes viscid. The viscid blood passes with more difficulty through the small arteries so that the work of the heart is increased and the pressure in the arteries rises. Water drinking washes out of the blood the substances which increase its viscidity, and thus lessens the work of the heart and lowers blood pressure. This fact is of special importance to persons who are suffering from high blood pressure.

Daily Water Allowance

Q. **How much water is required daily?**

A. The amount of liquid required by the body daily is sufficient to balance the loss through the skin, kidneys, lungs and other excretory organs. This has been shown to be about 2½ to 4½ quarts, the amount depending much upon the temperature of the air and the amount of work done and perspiration lost. Part of this water is derived from the food.

Distilled Water

Q. **In what diseases is it best to use distilled water?**

A. Distilled water is not really necessary for any disease. Water which is only slightly hard is entirely wholesome so long as it is pure.

Water-Drinking to Disinfect the Stomach

Q. **Is drinking water before meals a good practice?**

A. Yes. The stomach, like every other

cavity of the body which is exposed to infection from the exterior needs constant and thorough disinfection.

The mouth is cleansed by the saliva and buccal mucus which not only sweep away the germs which enter the mouth from the air and in the food, but when produced from clean, healthy blood possess the remarkable property of hindering the growth of germs even though not able to actually destroy them.

In addition to this there is an active destruction of germs by the white blood cells which enter the mouth in great numbers with the several salivary secretions and the secretion poured out by the mucous glands of the mouth.

These wonderful cells, the phagocytes discovered by Metchnikoff, are always present in the saliva which bathes the gums and the teeth and when examined under the microscope may be seen to be filled with germs which they have captured and destroyed.

The stomach is disinfected in a similar manner. Healthy gastric juice contains free hydrochloric acid which is a powerful disinfectant. The stomach produces daily from one-third to one-half ounce of pure hydrochloric acid.

The hydrochloric acid aided by pepsin not only digests the food but disinfects it, and after the food leaves the stomach, the gastric acid disinfects the stomach itself. This is highly important as a preparation for the next meal.

Hence it is necessary that the stomach should become empty and should have a short period of rest after each meal before food is again taken into the stomach. This will prepare the stom-

ach not only by ensuring perfect freedom from infecting bacteria but by giving the glands of the stomach and nerve centers which control its action an opportunity to replenish their energy for the digestion of another meal.

Pawlow showed many years ago that water drinking causes the stomach to pour out a highly acid secretion which is a powerful disinfectant. Hence the value of free water drinking a few hours after each meal or an hour before eating. It is also well to drink before retiring at night.

When to Drink Hot or Cold Water

Q. **Under what circumstances should hot and cold water be drunk?**

A. When there is pain or distress of the stomach it is generally well to drink very hot water. Hot water is also better in cases of hyperacidity. Cold water may be taken with advantage in cases of fever. In certain cases of ulcer of the stomach, it is better to take cold water, and also to take food cold rather than hot.

Q. **Should one drink hot or cold water before breakfast?**

A. That depends upon whether the gastric juice is too acid or not sufficiently acid. If the stomach makes too little gastric acid, one should drink a little cold water because this will stimulate the gastric glands. If too much acid is present take a glassful of hot water half an hour before eating.

When to Drink Water

Q. **How soon after a meal may one drink water?**

A. One may drink water in small quantities whenever he is thirsty. A little at a time is sufficient. The best times for systematic drinking to cleanse the blood are an hour before meals, on rising, and at bedtime. It is also a wise plan to drink whenever the bladder is emptied.

Cold Water at Meals

Q. **Is ice water healthful at meals or other times?**

A. Ice water, providing the water and ice are both free from contamination is entirely wholesome if properly taken. It is only necessary to sip the water slowly so that it will be warmed to near the temperature of the body by the time it reaches the stomach. There is no objection whatever to taking ice water, provided it is taken in this way, but great harm may come from swallowing large quantities of ice water, not warmed in the mouth, especially with the body heated or in connection with meals. When taken in quantity, ice water stops the process of digestion. The delay, according to Dr. Beaumont, who studied St. Martin's stomach, may amount to an hour or two. Evidently the habitual use of ice water at meals in large amounts may prove highly detrimental.

Most persons may take a tumblerful of cold water at a meal with no injury provided care is taken to sip it very slowly and in small quantities at intervals. To swallow a half pint of ice water at a single gulp is always harmful.

To sip cold water slowly is a rule which may be followed at all times with advantage. This plan eliminates the objections to the use of ice water and enables one to enjoy the superior refreshing effect of the cool liquid upon the mucus surfaces of the mouth and throat. The cold liquid seems to quicken and renew the acuteness of taste and the zest for food.

Sedentary Persons Need Water

Q. **Do sedentary persons usually need more water than thirst calls for?**

A. Yes. Sedentary persons who generally perspire little ought to take care to drink freely, even though they are not thirsty. Exercise not only tends to promote more complete burning up of the waste substances of the body, but at the same time causes perspiration, which produces a desire for water, the drinking of which facilitates the washing away of the tissue wastes. Sedentary persons, however, not only suffer from imperfect oxidation of waste substances, but the lack of perspiration limits the amount of water taken, and so the imperfectly burned wastes are left to accumulate in the tissues.

This is the source of some of the greatest evils which arise from a sedentary life. A person whose employment is sedentary, who does not perspire freely should constantly encourage himself to drink to the extent of three or four pints of water daily whether he has a desire for it or not.

Juice of Dried Fruits

_Q._ How can the juice of dried fruits, as of prunes or apricots, be obtained?

A. By soaking the raw fruit in just sufficient water to cover the fruit so that all will be absorbed. After soaking for twenty-four hours, squeeze out the juice in the usual way. Juice thus prepared is much better than the juice of cooked fruits, but not so good as the juice of fresh fruit, freshly extracted. The drying of fruits injures or destroys some of the valuable vitamines which abound in fresh foods.

Anti-toxic Glands

_Q._ What are the anti-toxic glands?

A. Notwithstanding the marvelous activity of the intestinal mucous membrane and the liver in the exclusion, destruction and attenuation of poisons, still a considerable quantity of toxins reach the general circulation, especially in cases in which intestinal putrefaction is active. The destruction of these poisons is a function which pertains to a class of glands the purpose of which was not understood until the development of the doctrine relating to auto-intoxication by Bouchard and his followers.

It is now known that the thyroid gland, the suprarenal capsules, the pituitary body, the parathyroid, and the thymus glands are actively engaged in the destruction or antidoting of toxins absorbed from the intestine and circulating in the body through the blood and lymph. Dogs fed on meat die quickly after the operation of thyroidectomy, as shown by Horsely and Schiff. Rabbits suffer little inconvenience from

the operation. Dogs fed upon bread and milk are nearly exempt from ill-effects from the operation, but die quickly when fed on beef tea and roast meats. Here is another graphic illustration of the difference between a flesh diet and a non-flesh dietary as regards the protective struggle required by the body. Combe, nearly twenty years ago from observations made upon infants, was led to believe that the chief function of the thyroid and parathyroid was to destroy the products of intestinal putrefaction. His views seem to be confirmed by the very recent observations of numerous investigators, particularly those of Blum and Kishi. Blum holds that the thyroid neutralizes the toxins produced by the putrefaction of albumens in the intestine. Kishi believes that a highly toxic substance which he calls prothyreo toxin, a nucleoproteid, is produced by the putrefactive decomposition of meat in the intestines and that the secretion of the thyroid gland, thyroidin, has a special affinity for this poison and combinng with it forms thyreotoxin, which splits up into two harmless substances which constitute the internal secretion of the thyroid gland and are eliminated by the kindeys. This protective action, according to Kishi, is carried on by the thyroid and parathyroid glands in conjunction. When these glands fail to do their work, the prothyreotoxin accumulates in the body and general toxic symptoms develop in the nervous system and the entire body. When the insufficiency exists in the parathyroids alone, the result is tetany. If the insufficiency is in the thyroid, the result is myxoedema.

The pituitary body is a remarkable structure, formerly regarded as a gland, now known to be half gland and half ganglion. Notwithstanding its minute size it is believed to play a highly important part in the defense of the body against entero-toxins. The action of the pituitary body appears to be in some way related to the suprarenal capsules.

Gley, Oliver, Abelous and others have clearly established the importance of the internal secretion of the suprarenals as an anti-toxic agent, of great importance in the protection of the body against colon toxins. Charrin has shown that suprarenal secretion attenuates the toxicity of alkaloids, and Gourfein has established the fact that the secretion of the suprarenals neutralizes or destroys a number of toxic substances which are found in the blood stream. Muhlman discovered that the suprarenals destroyed a highly toxic substance resulting from intestinal putrefaction, *brenzcatechin*, to which the pigmentation of the skin, so commonly seen in intestinal autointoxication, is due. This discovery makes clear the reason for the remarkable pigmentation of the skin which occurs in Addison's disease and the "liver spots" of old age.

The Blood Cells

Q. **In what part of the body is the blood produced?**

A. Carefully conducted researches have revealed the remarkable and interesting fact that the bones are active in the formation of blood cells. The marrow of the bone produces both red and white corpuscles. The white blood cor-

puscles produced in the bones are somewhat different in appearance from those of the spleen and lymphatic glands, and in certain forms of disease are produced in excessive numbers.

Poor Circulation

Q. What may be done for poor circulation?

A. The difficulty is probably due to a vasomotor spasm of the vessels in the extremities. The most common cause is toxins absorbed from the intestine. The bowels should be made to move three or four times a day by regulation of the diet and the free use of sterilized bran and paraffin oil.

Effect of Fruits on the Blood

Q. Does the blood become acid from eating acid fruits?

A. No. We cannot make the blood alkaline or acid.

The blood always remains neutral, but the tissues may become acid. They never can become alkaline. The body will not allow an excess of alkali because the alkalines have to be taken in but the acids are produced in the body.

They are both introduced into the body by the foods but the acids are produced in the body also and consequently it is necessary for us to take a diet which is largely alkaline in order to neutralize the acids of the body.

Normal Blood Count

Q. **What is the normal blood count?**

A. The average number of red blood cells pei cubic millimeter for men is five millions; in women the number of red blood cells is four and one-half millions. A millimeter is one-twenty-fifth of an inch. A drop of blood contains more than thirty times as much as a millimeter or about 160 million red blood cells.

Absorbing Area of the Red Blood Cells

Q. **What is the extent of the absorbing surface presented by the red blood cells?**

A. The total number of red blood cells in the body of a man of average size is about 25 million million. Each cell is about one three-thousandths of an inch in diameter. The combined absorbing surface presented by this great number of cells is about 150 square rods or nearly one acre.

Blood Pressure

Q. **What is blood pressure and how is it determined?**

A. The pressure against which the heart works in any given case is determined by means of the sphygmomanometer. Examinations made with this instrument show great variation in the blood pressure in various diseased conditions. In fevers and in many other conditions in which great bodily weakness exists, the blood pressure is often found very low. In cases of Bright's disease with arteriosclerosis, the blood pressure sometimes rises to three times the normal, or more than 300 millimeters of mercury. In shock, blood pressure falls far below the normal.

Meaning of High Blood Pressure

Q. **What is the significance of high blood pressure?**

A. A persistent high blood pressure compels the heart to do an enormous amount of extra work and wears it out, thus leading to dilatation of the heart and heart failure. With a blood pressure of 200 the heart does more than double the work required at 100. This extra labor wears the heart out rapidily. It is a very common thing to find the heart, blood-vessels and kidneys simultaneously diseased, so-called cardio-vascular-renal disease. These grave cases require prompt and persistent attention.

The rise of the blood pressure through hardening of the arteries is one of the early symptoms of approaching old age. It is also one of the premonitory symptoms of Bright's disease.

Every person over forty years of age should have the blood pressure taken at least once a year. When high blood pressure is discovered in the early stages, much can be done by change of habits and by the application of proper treatment toward the arrest of the disease and improvement of the patient's condition. A fall of twenty-five to fifty points, often more, is the usual result of special regimen and rational treatment in cases of high blood pressure.

Climate for High Blood Pressure

Q. **Which is best for one who has high blood pressure, a warm or a cold climate?**

A. The cold climate is better provided one keeps warm. One does not need to suffer from cold in a cold climate. The breathing of the cold

air is a very great advantage in cases of high blood pressure because it supplies the body with oxygen and helps to carry off poisons. A hot climate has a very depressing effect upon the heart. This is a great disadvantage to persons suffering from high blood pressure.

High Blood Pressure and Disease

Q. **In what diseases or conditions is high blood pressure found?**

A. According to Norris, high blood presure is observed in four classes of persons.

1. Those who present definite symptoms of disease of the kidneys. In these persons the cause of the kidney disease may be the use of alcohol, tobacco, tea or coffee, a heavy meat diet or constipation. The last named cause is the most common of all.

2. Cases in which the arteries are hardened. The hardened and sometime Tortuous arteries may be felt at the wrist, in the arm, at the temple and sometimes elsewhere in the body. The X-ray sometimes shows such arteries when much lime is present. Sometimes the changes in the arteries may be seen in the fundus of the eye by the ophthalmoscope. The changes taking place in the bloodvessels may be seen in the large vessels near the heart by the aid of the X-ray.

The most common causes of these blood-vessel changes are syphilis and autointoxication.

3. In cases in which both conditions are present the kidneys are diseased, as shown by examination of the urine, and the arteries are also hardened.

4. Cases in which, although the blood pres-

sure is high, no other evidence is present, either of the disease of the kidneys or the arteries.

The cause of high pressure in these cases is generally to be found in erroneous habits of life especially the use of tea, coffee, tobacco, beer and other alcoholics. It is also probable that poisons absorbed from the colon are about the most common of all causes. Pressure raising poisons have been found in the feces and, in fact, always present in colons of constipated persons and persons suffering from colitis.

Age and Blood Pressure

Q. **What should be the blood pressure at different ages?**

A. Thousands of intelligent men and women, past forty and fifty years of age, are nowadays beginning to ask this question of their physicians.

The answer sometimes given is this: Add one hundred to your age and you will know what your blood pressure should be.

This is an error.

The application of this rule does not give the normal blood pressure, although it does give very nearly, perhaps, the average blood pressure as found in the experience of life insurance examiners. At least statements of this sort have been made and it is probable that the findings of the life insurance examiners have furnished the basis for the rule referred to.

But the average blood pressure is by no means the normal blood pressure. Really there is only one standard for normal blood pressure and that is the pressure always found in a healthy person

twenty or thirty years of age, which may vary between one hundred and one hundred and twenty.

The blood pressure rises when old age processes begin, by which the small arteries are narrowed and the resistance, which must be overcome by the heart, thus increased. As age advances, the pressure rises more and more, increasing the work of the heart until finally the task becomes so great that it is no longer able to perform it efficiently.

Then it gradually weakens, the blood pressure falls, and finally heart failure closes the scene. This is the natural old age process, but it must not be forgotten that old age is a disease and a man is "as old as his arteries."

So, high blood pressure means old arteries, no matter whether this condition be found at forty or at eighty, but it is evident that a person who has at forty the blood pressure of another person at eighty, is older than he ought to be at forty, while the man who has at sixty or seventy the blood pressure of a man of thirty, is still young, notwithstanding the number of years that he has lived.

The normal blood pressure is that of youth and high blood pressure is always abnormal, whether it be found in a person of thirty or of sixty years. A person who at sixty or seventy years still has healthy arteries should have the same blood pressure as a person twenty or thirty years of age whose arteries are healthy.

Pressure Reducing Drugs

Q. **Is there any known medicine that will reduce high blood pressure?**

A. Yes, there are many drugs which will reduce blood pressure temporarily, or as long as the drug is being used. Nitroglycerine and nitrite of soda are especially active. The effect is disastrous, however, and death is hastened. Blood pressure should be reduced by removal of the cause. Pressure is never any higher than it needs to be. The injury is not from the high blood pressure, but from the poisons which produce the high pressure and cause degenerations in the heart, kidneys and other organs. Pressure-lowering drugs are very rarely indicated and are very little used by up-to-date specialists in diseases of the heart.

The best and safest means of reducing blood pressure are the avoidance of meats, tea, coffee, alcohol, tobacco, condiments, warm baths, rest, and moderate exercise. Automatic exercise, by means of an electrical apparatus for the purpose, is an excellent means of lowering blood pressure.

Sugar in the Blood

Q. **Is sugar normally found in the blood, and in what quantity?**

A. The normal blood contains about one part of sugar in one thousand.

When the amount of sugar is greater than this sugar appears in the urine. In cases of diabetes the amount of sugar in the blood may become three or four times the normal.

In diabetes the sugar of the urine may be

made to disappear while an excess of sugar in the blood still remains.

Fainting

Q. **What causes fainting?**

A. For some one of many reasons the blood recedes from the brain and when the brain is too much depleted of blood unconsciousness results.

Viscosity of Blood

Q. **Does the blood ever become too thick?**

A. There is no doubt that the viscosity of the blood is sometimes abnormally increased. In common parlance, the blood becomes too thick. This increases the work of the heart in driving the blood through the small vessels and the blood pressure rises.

Iodide of potash is often given to reduce viscosity of the blood.

Recent scientific experiments show that a single hot bath taken for fifteen minutes may produce an effect in lowering the viscosity of the blood equal to the maximum effect which may be obtained from iodide of potash. There is this important difference, however, between these two agents: the bath may be repeated an indefinite number of times without any injurious effect upon the body, whereas the continuous use of iodide of potash sooner or later results in iodism and various pathological changes more or less grave in character.

A fact which is highly worthy of note in this connection is that the changes produced in the viscosity of the blood by hot baths and cold baths have the same influence upon blood-pressure as

do the vasomotor and other effects produced by hot and cold baths respectively; that is, the warm baths lower blood-pressure by dilating the surface vessels and inhibiting the vasomotor centers, while at the same time lessening the viscosity of the blood and thereby diminishing the effort required to force the blood from the arterial reservoir through the arteries into the venous system of low-pressure reservoirs.

Diminished Blood Cells

Q. **Is it possible for a person's health to improve while the blood cells are diminishing in number?**

A. An eminent physiologist, Von Hoesslin, called attention to the fact that when the weight of the body increases and health improves, the hemoglobin of the blood may diminish. This is not because the red cells or hemoglobin have been destroyed, but is simply an indication that the volume of the blood is increased or regenerated more rapidly than the red cells. The increase in the number of cells comes later.

Vertigo

Q. **What is the cause of vertigo and what is the remedy?**

A. There are various causes. Here are a few: Menier's disease, a disease of the inner ear or labyrinth; arteriosclerosis; anemia; general weakness, especially a weak heart; intestinal toxemia or autointoxication due to constipation and colon infection.

When the attacks of vertigo occur only occasionally they are very likely due to indigestion.

It must be remembered, however, that in certain mild forms of epilepsy the patient suffers from attacks which are often described as vertigo, the so-called *petit mal.* When the vertigo is constant or very frequent, some profound disturbance of the bodily functions almost certainly exists. This may be hardening of the arteries, degeneration of the heart or kidneys, or some other grave condition. Occasionally the giddiness may be the result of the use of drugs, especially of headache powders and sleep-producing drugs. Bromide of potash causes very severe vertigo when freely used.

In every case of vertigo the cause must be diligently sought for and removed. When the attack is accompanied by pallor, the patient should lie down; or if this is inconvenient, he may simply bend the body forward so as to hold the head as low down as possible. If the face is flushed, the patient should lie down with the head well propped up and cold cloths should be applied to the neck and head.

Not infrequently the cause of giddiness is simply constipation. Poisons absorbed from the colon affect the brain as do certain drugs. An enema may be given for temporary relief, but the real remedy will be found in training the bowels to move well three or four times a day.

Certain persons suffer from vertigo after taking an enema. The cause may be the drawing of too much blood to the abdominal vessels. Using water at 80° F. or less will usually prevent the vertigo.

Vertigo is likely to follow a very long hot

bath because of the weakening effect of the bath upon the heart and the great dilation of the surface vessels. A dash of cold water will cause the symptom to disappear.

Vertigo with pallor may usually be relieved by a dash of cold water upon the face or chest or by applying hot cloths to the head.

Neurasthenics often suffer much from vertigo. In such cases the vertigo is usually accompanied by a feeling of constriction or a "band sensation" in the head with a sensation of pressure at the back of the head. There are also numbness and other disturbances of sensation in various parts of the body. In these cases, hot applications to the top and back of the head afford relief. Bathing the face with hot water is also beneficial.

The Diaphragm and the Circulation

Q. **Does the diaphragm aid in the circulation of the blood?**

A. The diaphragm in its downward movements, not only draws air into the lungs by an action resembling that of the piston of a pump, but while producing a suction effect in the chest, the descending diaphragm at the same time compresses the liver, stomach and other viscera against the tense abdominal wall; it thus empties them of blood, and so assists the portal circulation, by propelling the venous blood of the abdomen toward the heart.

The influence of the diaphragm also extends to the head and even more remote parts of the body. In fact, the diaphragm is one of the most important factors in the circulation of the blood.

In order, however, for the diaphragm to aid the circulation it must have an opportunity to act efficiently. This it cannot do if it is cramped and hindered by tight clothing. As commonly worn corsets and waist bands greatly hinder the action of the diaphragm, preventing it from descending properly.

A stooped or "slumped" position in sitting or standing is most as injurious as waist constriction. This position relaxes the abdomen and so prevents the proper ascent of the diaphragm.

Blushing

Q. **What is the cause of blushing?**

A. The sudden reddening of the cheeks known as blushing, is due to the influence of certain emotions upon the vaso-motor center, that is, the part of the brain that controls the blood vessels of the body. In some persons, blushing is wholly confined to the cheeks, while in others it extends to the forehead, and in still others to the neck and shoulders.

Apoplexy

Q. **What is the cause of apoplexy?**

A. Rupture of an artery.

It is not always, however, that the artery ruptures because of excessive pressure. A healthy artery is able to resist a pressure many times that to which it is usually subjected. The real cause of the rupture is weakening of the wall of the blood vessels the result of degenerative change.

Arteriosclerosis—Hardening of the Arteries

Q. **What is arteriosclerosis?**

A. This disease is much more common than formerly supposed. The cause is the circulation of poisons in the blood. There are many poisons which produce hardening of the arteries. The most active of these are syphilis, lead, alcohol, tobacco, caffein, the poison of tea and coffee, and last, but not least, colon poisons. It is probable that poisons generated in the colon from the putrefaction of undigested portions of meat are the most common and most serious cause of hardening of the arteries and premature senility. A very common symptom which results from hardening of the arteries is a rise of blood pressure. The normal blood pressure is 100 to 120. In arteriosclerosis the blood pressure may rise to 200 and even 300. In many cases changes of the arteries occur without a rise of blood pressure.

An elevation of blood-pressure generally gives rise to very little inconvenience at first. Later come shortness of breath, insomnia, and numerous other distressing symptoms. High blood-pressure is an exceedingly grave symptom, and when found present should lead to an immediate change of habits in renouncing the use of tea, coffee, tobacco, alcohol or any other habit drug.

Condiments must be discarded from the dietary; also meats of all sorts. The bowels must be made to move three or four times every day.

Every possible means should be taken to suppress the development and absorption of poisons.

An out-of-door life, a large amount of moderate exercise and warm (not hot) baths are of great importance in reducing the high pressure. The electric light bath used in moderation renders most valuable service. Massage of the whole body and thorough friction of the skin should be applied daily. In many cases these simple measures bring down the blood-pressure thirty or forty points, sometimes even more. Arteriosclerosis is naturally a progressive disease, hence must be fought with great thoroughness and persistency. A person who finds himself a victim of the malady must prepare himself for a life-long struggle with the disease as the only condition on which he can hope to extend his life for any considerable period. The final result of arteriosclerosis is apoplexy, Bright's disease, heart disease, or a combination of the three maladies, or the so-called cardio-vascular-renal disease.

When the disease is localized in the kidneys, a form of Bright's disease develops. In the liver the result is cirrhosis. In the brain apoplexy occurs through rupture of the degenerated arteries. In the early stage of the disease the blood-pressure rises slightly above normal, but when the number of blood vessels affected is so great that the area for the circulation of the blood is materially diminished, the blood-pressure is raised as a compensatory measure so that a proper amount of blood may be distributed to the various bodily organs. As a matter of fact, the blood-pressure is never any higher than it needs to be to secure the proper blood supply for each bodily organ.

Early Signs of Arteriosclerosis

Q. **What is the first indication of hardening of the arteries?**

A. Usually one of the first indications is the rise of blood pressure. Rise of blood pressure, however, is not in itself a proof positive of hardening of the arteries. Sometimes, also, the disease is far advanced before rise of blood pressure occurs. In very advanced cases, the blood pressure falls because of weakening of the heart.

Exceptional Causes of Arteriosclerosis

Q. **What causes arteriosclerosis in persons who never used tobacco, alcoholic drinks or much meat?**

A. Inactivity of the bowels, tea, coffee and tobacco are causes. Constipation doubtless is the most important of all causes. The use of tea and coffee is harmful as well as the use of tobacco.

Lead from lead pipes will produce hardening of the arteries. Typhoid fever and other infectious diseases are common causes.

Increase of Heart Disease

Q. **Are diseases of the heart and blood vessels increasing?**

A. The cause of the increase of these two highly fatal diseases is very likely to be found in the steady increase in the use of tobacco and alcohol.

Within the last ten years the mortality from heart disease has increased over 50 per cent, the mortality from arteriosclerosis has increased from

6.1 per hundred thousand in 1900, to 21 in 1911, an increase of nearly 250 per cent. According to the Census report, nearly four times as many people die from disease of the blood vessels to-day as thirty years ago.

Q. **Does coffee cause high blood pressure?**

A. Yes. Tea and coffee contain caffein, a pressure-raising drug. A cup of coffee contains four grains of caffein, or two medicinal doses. Coca-cola contains as much caffein as coffee.

Organic Heart Disease

Q. **Can leakage of the heart be cured in the case of a man of forty years?**

A. Organic disease of the heart can not be cured, but much can be done to aid the patient to tolerate the disease so that serious symptoms may be postponed for many years.

Very hot baths must be avoided in cases of heart disease and cold applications must be made with great care.

Causes of Heart Failure

Q. **What is the cause of heart disease?**

A. The most common causes of heart failure are the presence of poisons in the blood and degeneration of the arteries. Nicotin, alcohol, tea and coffee, the free use of flesh foods, and constipation are among the most common direct and indirect causes of heart failure.

Soldier's Heart

Q. **What is the nature of the condition known as soldier's heart?**

A. A careful study of the subject seems to show conclusively that "soldier's heart" is a term which includes a number of conditions due to various causes and which present in common a group of symptoms the chief of which are breathlessness, palpitation, giddiness or fainting, exhaustion on slight exertion, and pain in the region of the heart, increased by exercise.

An exhaustive study of this subject shows that these symptoms are not caused by excessive muscular exertion. In other words that so-called "heart strain," instead of being a common occurrence is exceedingly rare.

Mackenzie, the eminent English heart specialist, declares that although he has examined a great number of athletes' hearts he has never found a single case of over-strain.

It is quite natural to suppose over-strain to be the cause of so-called "soldier's heart," because the symptoms appear during vigorous exercise, and usually wholly disappear or nearly so, during rest.

Among the causes mentioned by the authors quoted by Dr. Musser, are infection, injury of the heart by rheumatic attacks, toxemia, and poisons, as in cigarette smoking and the use of strong coffee.

No matter what the cause of the cardiac disturbance, it is universally admitted that smoking "is an important contributory factor in the breathlessness and precardiac pain in many cases."

Rudolf considers that tobacco is a cause of soldier's heart in many cases.

Tullidge, during service in the Austrian army, noted a number of cases in which the heart disturbance could be traced directly to the use of tobacco.

The simple facts, then, are these: The soldier is liable to suffer from heart ailments generally known as "soldier's heart." Smoking increases the liability to the disease and aggravates it when present. It is evident then, that smoking is not good for soldiers.

Tobacco and Heart Disease

Q. **In what way does tobacco affect the heart?**

A. Dr. J. F. Bary, F. R. C. S., of Cork, reports in the *London Lancet* the results of an extended research made for the purpose of determining the effects of nicotine upon the heart. This able investigator demonstrated that nicotine is a heart poison and when applied to the beating heart of the frog causes permanent arrest.

When it is remembered that cutting off the head of a frog does not stop the beating of its heart for hours and that the amphibian's heart may even beat for days after removal from the body, it is evident that a drug which will instantly stop the heart action so that it will never beat again must be a powerful heart poison.

In other words, nicotine applied to the frog's heart will kill the animal more quickly than cutting off its head.

Heart Failure

Q. **What are the symptoms of heart failure?**

A. There are various symptoms by which the failure of the heart to do its duty is indicated. One of the most common is shortness of the breath. It is one of the duties of the heart to pump the blood through the lungs for purification. When the heart is not able to pass the blood through the lungs rapidly enough to keep the blood free from carbon dioxide, this poison accumulates in the blood and shortness of breath is the result.

Another common symptom is swelling of the feet. Swelling of the feet is generally an indication either that the heart is weak or that the kidneys are diseased. Both conditions may exist at the same time.

Still another indication of weakness of the heart is blueness of the lips. This symptom indicates that the blood is not being circulated fast enough to keep it free from carbon dioxide. That is, the blood in the arteries instead of being of the natural scarlet color differs little from that of the veins because of the lack of oxygen.

Still another and a very important indication of heart failure is increase in the pulse rate. When there is found to be a progressive increase from day to day in the rate of the heart beat, the significance is that the heart is becoming progressively weaker and weaker. Suppose for example, the rate of the pulse today is 75, tomorrow 78, next day 80, the following day 85, a day or two later 90, some days later 110, at the end of two or three weeks, 130 or 140. The

indication is very certain that the patient is suffering from progressive and increasing weakness of the heart which will finally result in heart failure. An intelligent nurse or a wise physician will, of course, note the significance of this symptom and will take measures to arrest the progress of the disease which is causing the heart weakness.

One of the most efficient means of strengthening the heart is the cold compress over the heart or even an ice bag. If an ice bag is used it should be protected with one thickness of flannel to avoid excessive chilling of the skin. The cold application should be removed at least once in twenty minutes. It may be reapplied after an interval of five minutes. The purpose is to give the skin a chance to react. Reaction may be encouraged by rubbing the skin with the hand so as to restore the warmth of the part. By this means the nerves are kept active and so the reflex effect through which the good result is produced may be maintained for an indefinite time. Short cold rubbing baths, deep breathing and massage are other means of aiding the weakened heart and combating heart failure.

Ordinary fainting is a condition of heart failure. This condition is most successfully combated by the application of cold over the front of the chest. Percussion over the heart is also beneficial. Application of cold to the face, in fact to any part of the body, is also helpful. To produce the strongest effects, a cold application may be made to the whole surface of the body.

Blue Lips

Q. **What causes blueness of the lips in heart disease, especially on exercise?**

A. The effect of exercise upon a person suffering from heart disease is quite different from that of a person in health. In health the amount of carbon dioxide in the body is greatly decreased by exercise whereas in the case of persons suffering from disease of the heart the amount of carbon dioxide may be increased to nearly fifty per cent above the normal. It is this accumulation of carbon dioxide in the blood which produces the shortness of breath and the blueness of the lips which are characteristic of this condition. In persons suffering from disease of the heart in an advanced stage, the blood is constantly over loaded with carbon dioxide.

Athletic Heart

Q. **Is it possible for a person to be a long distance runner without getting "athletic heart?"**

A. Yes. One of the greatest athletic events in 1916 was a run of one hundred miles, made between Milwaukee and Chicago by Sydney Hatch.

The former record for this run was eighteen hours, but was lowered by Hatch to fourteen hours. Every foot of the journey was run, and the only stops made were four, aggregating one-half hour.

This run is remarkable, not only because of the time that was made, but also because Mr. Hatch made it at an age that is supposed to be

beyond the period of active athletics—thirty-four years.

Still, one need not be surprised when he learns of the method of living followed by Mr. Hatch. He abstains absolutely from alcoholic liquors of all kinds, as also from tobacco. More than this, although he has made more runs than any other two athletes in this country, he has not developed what is known as an "athletic heart." Clean living and adherence to clean ideals have preserved his heart intact.

Work of the Heart

Q. **Has any estimate been made of the work that is done by the heart in circulating the blood?**

A. Yes. The work of the heart of an ordinary man in twenty-four hours is equal to many tons.

It has been estimated that the heart at each beat does work equal to lifting one pound one foot high. The amount of energy consumed is 1/1000 of a calory. The work of the heart muscle is about one-tenth of the work done by the entire body.

The rate at which the heart works varies with many conditions. On counting the pulse at the wrist, the ordinary rate in an adult, sitting upright, is found to be 68. In the same person lying down the pulse rate will be found to be 64 beats, and in the standing position the rate would be increased to 78. Walking at a moderate rate usually raises the pulse to about 100, while by running and other violent muscular efforts, it may be increased to 180 or even more. The

pulse rate of an infant is about 130 to 140; that of a child of ten years, 90. In aged persons the pulse is likewise found to be five to ten beats faster than in middle age.

The Blood Supply

Q. **How much blood is contained in the body of a person of average size, and what proportion of the blood goes to different organs?**

A. Each organ requires a certain blood supply according to its size and its functional activity. Wiggers has determined the amount of blood required by various parts of the body per minute. The figures given show the volume of blood in proportion to the organ supplied.

Leg	5 per cent
Muscles	12 per cent
Heart	16 per cent
Stomach	21 per cent
Pancreas	80 per cent
Liver	84 per cent
Brain	136 per cent
Kidney	150 per cent
Thyroid gland	560 per cent

The activity of an organ and its importance to the body may be judged somewhat by the amount of blood which it requires. The amount of blood supplied the muscles may be increased during work to twenty times the volume received when at rest.

Shivering

Q. **What is the cause of shivering?**

A. Shivering occurs when the temperature of the blood has been reduced a few tenths of a degree.

Muscular action is always attended by the production of heat as a by-product. When the temperature of the blood is lowered, shivering, an involuntary action of the muscles, takes place as a defensive effort having for its purpose the production of heat. Shivering is thus a remedial process and may be even encouraged with advantage. An eminent English traveler who explored the Arctic regions, in giving an account of his experiences mentioned that on a certain occasion he and his companions having become greatly chilled by exposure sat down upon a block of ice and shivered themselves warm.

Hemorrhage

Q. **By what means may hemorrhage be controlled?**

A. The principal means to be employed for arresting hemorrhage are pressure, ice or cold water, hot water, and the ligature. The means to be employed differ somewhat according to the part in which the hemorrhage occurs. As a general rule, the bleeding part should be elevated, and pressure applied at the point of injury. Very hot or very cold applications should be made. Pressure acts by closing the blood vessels and allowing the blood to coagulate. Cold at first causes the blood vessels to contract; but if applied continuously for a long time, the blood vessels are paralyzed and become relaxed.

In using the ligature, apply it either above or below the injury if it occurs in a limb, according, as the bleeding comes from an artery or a vein. If an artery is wounded, the blood will flow in jets; if a vein is injured, the blood will be dark in color and will flow in a steady stream. If the vessel is an artery, the ligature or pressure should be applied between the wound and the heart; if a vein, it should be applied on the opposite side. A slight hemorrhage from a wound may generally be very easily controlled by pressure upon the injured part with the fingers or a compress of folded muslin.

Bleeding from the nose may generally be checked by holding the head erect, snuffing cold water up the nostrils and holding the arms as high as possible.

Hemorrhage from the stomach, indicated by vomiting of blood, requires perfect rest, the application of ice over the stomach, and swallowing small bits of ice in rapid succession. Hemorrhage from the lungs requires heat at the extremities; restraint from coughing; the application of cold to the chest, ice pills, and the inhalation of an atomized solution of tannin, or the vapor of turpentine.

Hemorrhage from the bowels generally results from hemorrhoids. Cold water should be injected into the rectum, and the patient should be kept quiet in a horizontal position.

Bleeding from a rupture of varicose veins in the lower limbs is sometimes very severe. It may be relieved by a tight ligature both above and below the point of rupture.

The Kidney

Q. **What are the causes of kidney disease and how may the health of the kidneys be maintained?**

A. To understand the hygiene of the kidney, one must know something of its structure.

The kidney is one of the most remarkable structures in the body. Examination of the kidney with a microscope shows that it consists of a great number of microscopic filters, which

MINUTE STRUCTURE OF THE KIDNEY

are bound together in a bundle and supported by a cement substance which completely fills the space between the delicate filters and supports each one in its place.

The accompanying cut shows the appearance of a single one of these microscopic filters, which have for their function the removal of some of the most deadly poisons which are found

in the body. Each kidney contains some 2,000,000 of these ingenious devices for purifying the blood, or 4,000,000 for the two kidneys.

Each tube is about one and one-fifth inches in length. If all these millions of tubes were arranged end to end they would form a pipe seventy-five miles in length.

The kidney filter does an immense amount of work. The amount of fluid passing through the filter in a lifetime of sixty years is about one hundred and forty barrels, having a weight of more than sixteen tons, and containing nearly three-fourths of a ton of solid material, of which the kidneys remove from the body about one ounce daily. Each little kidney filter secretes one-fourth of an ounce of urine in a lifetime of sixty years. By working constantly day and night, a single filter separates from the blood one drop of urine every three months.

It is manifest that if we have only 4,000,000 kidney cells and no way of reproducing those that may be damaged or destroyed, it behooves us to take good care of these important structures.

It also evident that a structure so delicate that three months' time is required to enable one kidney cell to secrete a single drop of urine, or one one-hundredth part of a drop in one day, must be easily subject to injury.

For example, the two kidneys are expected to remove from the body about one-third of an ounce of urea, the waste or end product of protein metabolism. That is, the protein we eat in the form of gluten, egg albumin, meats of various sorts,

milk, cheese, etc., after being used in the body, appears in the urine in the form of urea. This is the chief waste element found in the urine. Urea is not a highly poisonous substance, but of course the larger the amount in the blood the more work the kidneys must do.

Another poison found in the urine is uric acid. This waste substance is normally found in the urine only in very small quantity, not more than six grains a day in a person living on a biologic diet. This uric acid comes from the tissues. The flesh of all animals contains uric acid. The flesh of an ox (beefsteak) contains fourteen grains of uric acid to the pound, or more than twice the amount normally eliminated in twenty-four hours. If a man eats a pound of beefsteak then his kidneys have to do three times as much work in the elimination of uric acid as it normally does. A pound of sweetbreads contains 70 grains of uric acid or more than ten times the amount which is the daily task of the kidneys to eliminate.

Carnivorous animals like the dog and lion, are provided with a means for destroying uric acid. Their livers convert uric acid into urea or an equivalent substance. The fact that the human liver is not able to do this is evidence that it is not prepared to deal with the excess of tissue poisons introduced with a meat diet.

The significance of this fact in relation to the kidneys is this: Urea is the normal excretory product, and is easily eliminated. Uric acid is highly poisonous and is eliminated with so much difficulty that the normal amount excreted is

twenty times less than that of urea. Hence a hearty meat diet throws upon the kidneys a very great and heavy load of work which it ought not to be asked to do. The uric acid irritates the kidney and damages its delicate cells. The uric acid crystals are deposited in the kidney and stones are formed which sometimes find their way into the bladder and form calculi. Sometimes these stones lodge in the kidney or the ureter, the canal which connects the kidney with the bladder, and give rise to great pain.

Kidney Enemies

Q. **What are the most common causes of kidney disease?**

A. A common cause of kidney disease is the use of irritating condiments, mustard, pepper, pepper sauce, ginger, cayenne, capsicum, horse-radish, and piquant sauces of various sorts. These substances all contain essential oils that are highly irritating and poisonous. They are all eliminated through the kidneys and damage their delicate structures and make them prematurely old.

Tea and coffee are especially harmful to the kidneys. The caffein of tea and of coffee is essentially the same as uric acid and produces essentially the same effects. A cup of coffee contains more uric acid than the same amount of urine.

Alcohol is another enemy of the kidneys. Kidney disease is more common in Bavaria than in any other country, where light beer is almost universally used.

The nicotine of tobacco is one of the worst of kidney poisons. When a man is found to have kidney disease, the doctor's first suggestion is, "Stop smoking." Of course the doctor knows that giving up cigars will not cure his patient, but it will postpone his funeral. If he had stopped smoking sooner, he might have postponed the Bright's disease which threatens the funeral.

The excessive use of common salt is another very popular way of overworking the kidneys. Our food contains salt enough. We eat salt only to please a cultivated taste.

Neglect of water drinking must be named as another cause of kidney disease. The kidneys need water enough to make at least three pints of urine daily. An extra pint is better. Six or eight glassfuls of water daily is not an excess and greatly helps the kidneys by diluting the poisons.

Constipation is probably one of the most potent of all causes of premature failure of the kidneys. The enormous quantities of deadly poisons produced by the putrefaction of retained fecal matters, as shown by foul stools and symptoms of autointoxication, imposes upon the kidneys a most onerous task, which wears them out at a rapid rate. The colon poisons are chiefly eliminated by the kidneys after having been worked over by the liver, which also suffers from the great burden of unnecessary work thrown upon it.

Still another very common cause of damage to the kidneys is acute infectious disease. Scarlet fever, smallpox, typhoid fever, pneumonia, in-

fluenza, diphtheria, even measles, and often in what are termed mild cases, may cause acute inflammation of the kidneys, thus doing a damage which permanently cripples these organs, even though the existence of the injury may not appear until many years later.

Bright's Disease

Q. **What can be done for a man who has been found to have chronic Bright's disease, or degneration of the kidneys?**

A. Much may be done. The kidney cannot be restored to full soundness, but it may be conserved—

1. By avoiding all causes of kidney irritation or overwork,
2. By adopting a biologic diet,
3. By copious water drinking,
4. By an out-of-door life and regular habits,
5. By training the bowels to move three times a day.

By the use of these simple means one may prevent the premature failure of the kidneys, and if evidence of disease appears, may hold it at bay for many years. By lightening the work of the kidney in every possible way, its activity may be prolonged for many years after it would have failed without the aid of these rational measures.

Uric Acid

Q. **Is uric acid harmful? How may an excess of uric acid be gotten rid of?**

A. Uric acid is unquestionably a tissue poison. It may not have the connection with rheumatism which was formerly attributed to it

by Haig and others, but uric acid is certainly a tissue poison. It not only produces gout, but is unquestionably the cause of high blood pressure, of disease of the kidneys and of various forms of nervous disease. Uric acid is produced in the body in small quantities as a result of the activity of the tissues, especially of the glandular organs. The amount of uric acid produced in the body and excreted through the kidneys, according to Magnus-Levy, when none is taken in the food, is about four to nine grains. On an ordinary mixed diet the quantity is more than doubled and when flesh foods are freely used the amount may increase to five or six times the normal amount. Beefsteak contains fourteen grains of uric acid to the pound which is double the amount with which the body is required to deal when the diet is restricted to natural foodstuffs which do not contain uric acid in appreciable amount. Meats of all kinds increase the uric acid in the urine. This is particularly true of such foods as sweetbreads, kidney and liver, which contain five times as much uric acid as does beefsteak. Bouillon or beef tea and meat extracts have the same effect as meat. A pint or two of beef tea doubles the amount of uric acid in the urine. It was formerly supposed that the liver destroyed uric acid by converting it into urea, but it is now known that the human liver is not capable of doing this. In the dog and other carnivorous animals the liver destroys uric acid readily but in human beings and the higher apes the liver does not possess this function. This is certainly a very clear indication that foods containing uric acid

are not naturally intended for consumption by human beings.

Hindhede, of Copenhagen, has shown that the potato is an excellent food for washing uric acid out of the system. Potatoes should be used largely in place of bread and breakfast cereals.

Renal Efficiency

Q. **Is there any means by which the efficiency of the kidneys may be determined?**

A. Normally the kidneys are able to do more than twice as much work as is needed to maintain life. Many persons have been able to live for years after the removal of one kidney. When the kidneys are diseased it is highly important to know if possible to what extent the disease has destroyed the kidney. This information may be obtained by a renal efficiency test.

By means of recent discoveries it is now possible to determine with very great accuracy the efficiency of the kidneys, thus making it possible to judge of the degree to which the kidneys have been disabled by disease. This examination is of very great importance not only as an aid to prognosis but especially in surgical cases as a means of determining the ability of a patient to bear the administration of an anesthetic and of selecting the anesthetic to be used.

Living with One Kidney

Q. **Can a person live long after one kidney has been removed?**

A. The removal of one kidney has been successfully accomplished in many cases. One kidney is able to eliminate the waste products

which naturally escape through this outlet, at least under favorable conditions.

Vitzou, after removal of one-half of one kidney, a month later extirpated the other kidney and found that the half kidney remaining intact sufficed to maintain the renal function and that excretion and the internal secretions remained normal.

Many experiments have shown that human beings can exist with a single kidney, provided the organ is intact, and it has been observed that when one kidney is removed the remaining kidney enlarges considerably in size and its activity becomes very greatly increased. In young animals there is an actual increase in the number of secreting cells and of their tubes, while in adults there is merely an increase in the size of these secreting structures without any increase in the number of them.

It is thus apparent that Nature has provided a larger capacity for kidney work than is ordinarily required for the maintenance of life. This capacity may be reduced by removal of the kidney, as in the experiment above referred to, by damage inflicted upon the kidney by over work, and by the gradual deterioration which comes with age. So long as the kidney capacity is sufficient to deal with all the work required of it, no inconvenience is experienced, though the amount of toxins taken into the body and the amount of work required may be much larger than normal. But sooner or later the kidney becomes incapacitated by the extraordinary amount of work required of it, and then ill effects begin to make their appearance and the kidney fails prematurely. This is the fate of tobacco users.

Floating Kidney

Q. **What treatment is best for a floating kidney?**

A. It generally needs only to be let alone. An abdominal bandage may be worn.

Meat in Kidney Disease

Q. **Is a meat diet injurious in cases of kidney disease?**

A. The well-known experiments of Lehman show beyond question that the use of flesh foods requires more work of the kidneys than a vegetable diet. When living on an exclusively animal diet he found that the amount of urea eliminated by the kidneys was two and one-half times as much as when the diet was exclusively vegetable, and one and a half times as much when he partook of both animal and vegetable food.

This shows beyond question that when the diet is exclusively animal, the kidneys have more than double the amount of work to do than when it is vegetable. This excessive work must inevitably tend to the production of kidney disease, which is becoming a very common affection among the English and Americans, who, as is well known, eat more animal food than any other civilized nation.

Senile Kidneys

Q. **Do the kidneys grow old?**

A. "A man is as old as his arteries," said a famous French physician. It may be said with equal truth that a man is as old as his kidneys. Young kidneys are able to do many times the

work normally required of them. As age advances, the kidneys deteriorate as the result of their constant exposure to the influence of the poisons which they remove from the body. When the capacity of the kidneys is reduced to less than one-third the normal, life is soon ended through the accumulation in the blood and tissues of the poisons which it is the duty of the kidneys to remove.

Urobilin

Q. **What is urobilin?**

A. Urobilin is produced by decomposition of the pigment of the bile. It is not found at all in normal urine. According to Muller the urobilin found in the intestine is largely absorbed and again excreted in the bile. It is only when the amount of urobilin is greater than the liver can thus dispose of that it is absorbed into the blood and appears in the urine. Lauder-Brunton some years ago observed that the bile from a biliary fistula lacks the bitter taste which is characteristic of vomited bile. It appears then that there is really some truth in the old medical theory that the bile becomes thick or concentrated and that a person whose bile is in this condition may be benefitted by getting rid of a large amount of the bile by vomiting or purging. This perhaps explains the temporary benefit derived from the use of calomel which so long maintained the popularity of this harmful drug. The calomel by increasing the action of the bowels carries off a considerable quantity of bile, thus getting rid of the accumulated urobilin and other poisons which the bile contains and so relieves the

patient of the unpleasant effects produced by this powerful toxic substance. Bouchard showed, many years ago, that the bile pigment is one of the most poisonous substances produced in the body. Macfadyn and others have shown that urobilin is rarely found in the small intestine, being absorbed very quickly and completely after entering the intestine from the liver. Its production is confined to the large intestine by the putrefactive processes taking place there. It can readily be seen that in cases of incompetency of the ileocolic valve permitting the entrance of putrifying materials into the small intestine, the poisonous effects resulting from the absorption of urobilin must be greatly increased.

In the new born there is no putrefaction in the intestines and hence there is no urobilin found in the urine.

Odor of Ammonia in the Urine

Q. **What is the cause of a very strong odor of ammonia in the urine?**

A. Ammonia is one of the products of decomposition. Decomposing urine is accompanied by an ammoniacal odor. Decomposition taking place in the colon in constipation gives rise to the formation of ammonia, which may appear in the urine.

Albumin in the Urine

Q. **What form of kidney disorder is indicated by the presence of albumin in the urine?**

A. The temporary appearance of albumin in the urine indicates congestion of the kidneys, a very common result of constipation. When al-

bumin is constantly present, it indicates chronic degeneration of the kidneys, the result, according to Professor Fisher, of an undue accumulation of acids in the tissues. The concentration of these acids in the kidney results in the dissolving of the cement substance which holds together the cells of the kidney. This cement substance appears in the urine as albumin.

Painful Urination

Q. **What is the cause of painful urination?**

A. There are many causes. The most common cause perhaps is too highly concentrated urine, the result of insufficient water drinking. This condition is most likely to occur in the summer time when the skin is active. The majority of persons drink too little water. The amount of liquid taken should be at least three or four pints a day. There are many other causes, as cystitis or inflammation of the bladder, inflammation of the urethra, tuberculosis of the bladder, cancerous growths of the bladder, calculi, in men, enlargement of the prostate gland, in women displacement of the womb. When the cause is due to concentrated urine it is speedily relieved by drinking large quantities of water, hot or cold, or hot lemonade. A warm sitz bath, temperature 101° to 103° F. for five minutes, 98° F. for ten minutes, a fomentation over the bladder or a large warm enema will usually afford relief.

The Liver Functions

Q. **Has the liver any other function except to make bile?**

A. Every person is indebted to his liver for rescue from speedy death. This marvelously versatile organ has power to destroy poisons. If a person drinks water containing lead, or eats peas or pickles colored green with copper, the liver seizes upon the poisonous metal, and after discharging as much of it as possible through the bile, gathers the remainder up in its cells, thus preventing the circulation of the poison to the rest of the body. When a person is found suffering from metal poisoning, the fact is evident that the liver has been seriously damaged; otherwise other organs would not have suffered. The smoker, the user of alcohol, or the opium slave would have suffered death from the first indulgence in his poison were it not for this marvelous function of the liver. Tea and coffee, too, are active agents in causing premature breakdown of this important vital machine; and the same must be said of condiments, mustard, pepper, capsicum, spices, vinegar, hot sauces, and the use of chemical substances in bread making. All of these substances should be carefully avoided, unless one wishes to die prematurely.

The liver is the largest gland in the body and does more different things than any other organ. Here is partial list of its functions:

It makes bile.

The bile aids digestion by activating the pancreatic juice and emulsifying fats and promoting their absorption.

The bile is an excretion carrying out of the body the alkaline wastes and poisonous pigments.

The bile prevents germs from multiplying and making toxins and neutralizes germ poisons.

The liver stores up glycogen which it prepares from sugars of various sorts.

The liver converts glycogen or animal starch into sugar to meet the body's needs for fuel and regulates the supply to the tissues.

The liver converts surplus protein into urea.

The liver converts the protein wastes of the body into urea.

The liver absorbs poisons.

The liver destroys poisons or detoxicates them.

The liver produces ferments and hormones which are essential for the maintenance of life and health.

Test for Liver Disease

Q. **Is there any known test for disease of the liver?**

A. One of the special functions of the liver is the conversion of levulose or fructose into dextrose. In organic disease of the liver this power is diminished.

In applying this test the patient takes three or four ounces of levulose dissolved in water after which the urine is repeatedly examined at frequent intervals for some hours. If levulose is found in the urine, this fact is evidence that the liver is organically diseased.

Destruction of Poisons by the Liver

Q. **Does the liver destroy poisons?**

A. According to Von Noorden, plant alkaloids and putrefaction products lose, without exception, one-half, and often more of their poisonous properties if they pass through the liver before their entrance into the general circulation.

The same thing is also true of the decomposition products of protein (peptone and ammonium salts), and of the still unknown organic poisons which are found in the normal urine. This detoxication is not due to the excretion of the poisonous substances in the bile, for the bile contains only traces of alkaloids. It is, moreover, not dependent on simple storing up of the toxic substance. The liver forms new less poisonous compounds from the toxic substances by combination with carbohydrates. For this end the presence of glycogen in the liver is an essential factor. If the liver is made glycogen-free by hunger or experimental methods, then it loses its distoxicating power, and vice versa, poisonous substances produce a less toxic action if the glycogen content of the liver is increased by simultaneous administration of glucose.

Defensive Action of the Liver

Q. **Why is the liver called an organ of defense?**

A. The portal blood brings to the liver great numbers of bacteria which have been absorbed from the intestine and with these such bacterial toxins as have escaped the defensive action of the

mucous membrane, particularly the salts and ammonia compounds. Some of these poisons are converted into harmless urea and uric acids through the action of the liver by the aid of the various enzymes which it provides. Indol, skatol and other aromatic bodies are combined with sulphuric acid or glycuronic acid and by this process of conjugation are rendered infinitely less toxic. A considerable portion of these aromatic bodies are absorbed into the living substances and retained temporarily so that the amount of toxic matter which is permitted to pass into the blood at any one time is enormously diminished. This important action of the liver is clearly shown by an experiment which was performed by the aid of what is known as Eck's fistula. This experiment as seen done by the writer in the laboratory of Professor Pawlow of St. Petersburg consists in joining the portal vein of the ascending vena cava and afterwards ligating the portal vein between the anastomosis thus made and the liver. The portal blood is then cut off from the liver and turned directly into the systemic circulation. In a dog upon whom this operation was performed whatever substances were absorbed from the intestine were sent directly into the general circulation instead of being first passed through the liver. An observation which has a most important bearing upon the question here under discussion has been repeatedly made upon dogs having an Eck's fistula. Such a dog fed upon bread and milk enjoys good health and apparently suffers no inconvenience from the operation, but when placed upon a diet of meat, symptoms of pro-

found toxemia quickly appear and within three days the dog is dead. This experiment clearly shows that certain toxic substances are formed in the intestine of an animal fed upon meat diet which are not formed in a non-flesh-eating animal and that the action of the liver in destroying these poisons is essential to the life of a flesh-fed animal. No more graphic evidence of the protective action of the liver against the consequences of intestinal putrefaction could be afforded than this.

The work of the liver seems to be especially to destroy bacteria and the poisonous alkaloids and ammonia compounds which escape the action of the intestine. As long as the liver is intact and able to do its work efficiently, marked evidences of general toxemia or intestinal autointoxication do not appear even though an intensely active putrefaction may be taking place in the intestine. Certain French writers have attributed intestinal autointoxication to insufficiency of the liver, so-called "hepatism."

Torpid Liver—"Biliousness"

Q. **What is the cause of a sluggish or torpid liver?**

A. Sluggishness or congestion of the liver is never a primary cause of disease. It is doubtful if the liver is ever torpid. The liver may be over-worked, it may be worn out by excessive work, but it is never lazy. It is perhaps the most long suffering and abused organ in the body. The condition of torpid liver or biliousness is due to the over-eating of fats and meat or to constipation or both of these causes combined,

the natural result of over-eating. Constipation is the accumulation in the colon of large quantities of putrefying material. The absorption of the poisonous products of putrefaction into the blood would promptly produce fatal results were it not for the fact that the blood containing these poisonous matters is all conducted to the liver before distribution to the rest of the body. This affords the liver an opportunity to filter and destroy poisonous matters. When the amount of these toxic materials is greater than the liver is able to destroy they pass on into the blood and are distributed throughout the body. The result is the appearance of symptoms of poisoning, most prominent among which are headache, nausea, lassitude, drowsiness, loss of appetite, inability to concentrate the mind, indecision, irritability, dullness and sometimes sleeplessness, coated tongue, bad complexion, dark circles around the eyes; after some years brown spots upon the hands, premature old age, hardening of the arteries, Bright's disease and other chronic maladies. The remedy for this condition is to remove the cause by adopting a natural dietary and free water drinking. The diet should consist chiefly of fruits and vegetables. Cereals should be used in moderation. The bowels should move three or four times a day; the flora must be changed; the circulation stimulated by exercise; the skin should be awakened to activity by electric light baths and daily cold frictions.

The Bile

Q. **Is the bile a secretion or an excretion?**

A. The bile is both a secretion and an excretion.

The secretion of bile is continuous, persisting during starvation, increasing after eating. The amount depends somewhat upon the character of the diet.

The amount of secretion is one to two pints daily.

During digestion the flow of bile is increased.

A deficiency of bile encourages intestinal putrefaction. Such a deficiency is not due, as is often supposed, to a sluggish state of the liver but to the obstruction of the gall-ducts or to a catarrhal state of the ducts.

The Use of the Bile

Q. **Of what use is bile?**

A. Bile is, as has been stated, an excretion, carrying off alkaline wastes and various poisonous matters.

Bouchard showed bile to be six times as poisonous as urine. It is also useful in the digestion of food, especially in carnivorous animals.

In herbivorous animals the bile is practically nothing more than an excretion. The popular idea that bile is sometimes present in excess has no scientific foundation. When bile is lost through a biliary fistula, the amount of fat in the diet should be greatly reduced.

Deficiency of Bile

Q. **What is the cause of deficiency in the quantity of biliary secretion?**

A. A deficiency in the quantity of biliary secretion is frequently the result of autotoxemia. The liver is the filter of the body. Poisons which are ingested with the food, or which are formed in the intestinal canal as the result of fermentations and putrefactions, are afterward absorbed into the portal system and must pass through the liver before they can get into the general circulation. One of the chief functions of the liver is to remove these poisons from the blood and to oxidize or burn them up. When the liver is over-taxed by having an unusually large quantity of these poisons to deal with, the result is an alteration of its function, and frequently a deficiency in biliary secretion follows. The liver is most commonly over-taxed by errors in diet,— the use of an excess of proteins, tea, coffee, alcohol, tobacco, condiments, vinegar, and especially by fermentations and putrefactions which take place in the intestines. These putrefactive processes result in the formation of powerful poisons which are absorbed into the blood, thus throwing an extra burden on the liver, reducing its functional activity.

The Influence of the Bile Upon Bacteria

Q. **Is the bile an antiseptic or a germicide?**

A. The bile does not destroy germs, but Rogers, of Paris, has shown that bile prevents putrefaction in the intestine by favoring the growth of *bacillus coli* and discouraging the

more active putrefactive organisms, especially those which are more active in producing toxins and setting up putrefaction. Bile also lessens the production of bacterial ferments which act upon the food and produce some undesirable changes in it. Another valuable function of the bile is to neutralize the poisons which are produced by intestinal bacteria.

The Gall Bladder

Q. **What is the function of the gall bladder? and can it be dispensed with without injury?**

A. Since the operation for removal of the gall bladder has become quite frequent in recent years the question is often asked, "Of what use is the gall bladder?" And the next question invariably is, "If one can get along just as well without a gall bladder as with one, why does this organ exist?"

There are many animals which have no gall bladder. The horse is provided with a gall bladder, as is the rat, while the mouse has no bile reservoir. The elephant has no gall bladder, and there are many hundreds of persons who have had their gall bladders removed by surgery and who are, notwithstanding, in good health.

Experiments made by Drs. Judd and Mann a few years ago throw some light upon the question of the function of the gall bladder, although it cannot yet be said that we are thoroughly acquainted with the function of this part of the anatomy. That the purpose of the gall bladder must be something more than that of a

reservoir is evident from the fact that it is too small to be of any material use for the storage of bile. The liver makes every twenty-four hours about twenty ounces of bile. The capacity of the gall bladder is only two to four ounces, too small to be of any material use for storage.

Recent experiments seem to show that the probable function of the gall bladder is to act as a means of forcing the bile into the small intestine. The bile duct, at the point of entering the small intestine, is guided by a sphincter muscle known as the sphincter of Oddi. This delicate muscle closes the mouth of the duct, holding back the bile sufficiently to produce a back pressure equivalent to a water column four inches high. It has been found that in animals which have no gall bladder this pressure in the bile duct is absent, showing that the sphincter is not active. In animals possessing a gall bladder, the bile is held back until the ducts and the gall bladder are filled. Then the gall bladder contracts and forces the bile into the small intestine, thus producing an intermittent flow of bile into the intestine. In animals without a gall bladder, the flow of bile is continuous. Why this intermittent flow of bile is necessary has not as yet been explained. It may be that the gall bladder contracts synchronously with the movements which empty the stomach, so that the alkaline bile is projected into the intestine at the right moment to meet the acid gastric juice which pours into the duodenum when the pylorus opens.

Whatever may be the function of the gall bladder, it has been clearly demonstrated that its presence is not necessary for the enjoyment of good health. Certainly it has been amply demonstrated that a person whose gall bladder is diseased is better off without it than with it, and this is true no matter how useful a healthy gall bladder may be to its possessor.

Gall Bladder Disease

Q. **What are the symptoms of gall bladder disease?**

A. Recent researches have shown that in many cases in which pain is experienced during digestion the fault is not with the stomach but with the gall bladder. Formerly, the recognition of these cases was impossible, and patients continued to suffer, often during many months, while doctors guessed the nature of their ailments and experimented with various methods, hoping to find a remedy; but now it is possible to remove the uncertainty, in most cases, by means of an X-ray examination. When the X-ray shows the stomach to be normal and no cause for pain existing in that organ itself, the trouble will almost certainly be found to be a diseased condition of the gall bladder. The patient may have gall-stones, or be suffering from inflammation of the gall bladder or the gall ducts. These conditions are due to infection and may be permanently relieved by a suitable operation.

The last few years have made it possible to discover ocular evidence of disease of the gall

bladder in about 86 per cent of the cases in which disease actually exists. In fully half of the cases in which gallstones are present they may be seen by means of the X-ray.

Catarrh of the Liver

Q. **Is there such a disease as catarrh of the liver, and what are the symptoms?**

A. Yes. Attacks of pain in the pit of the stomach and in the region of the right side, with chills, fever and jaundice, are symptoms of catarrh of the bile ducts and gall bladder.

The Liver and Hyperacidity

Q. **Does disease of the liver cause hyperacidity?**

A. In recent years many important facts have been brought to light respecting the influence of disease of the gall-bladder and gall-ducts upon the stomach. Pain and distress at the pit of the stomach is now known to be in a very large proportion of cases due to disease of the gall-bladder and the gall-ducts rather than of the stomach. In these cases the pain disappears when the cause is removed by draining the gall-bladder or removing gall-stones which are often present. Hyperacidity is always found present in cases of jaundice except in cases of chronic gastric catarrh in which the secreting glands of the stomach have been destroyed.

Liver Spots

Q. **What are liver spots and how can they be removed?**

A. The brown spots which appear upon the hands and face, as well as the dark circles which are often seen about the eyes, and general brownish pigmentation of the skin, are all due to the same cause—namely, chronic autointoxication. Through the putrefaction of animal matters, particularly undigested particles of meat, in the colon, a highly poisonous, brownish-colored pigment is produced. This pigment is normally destroyed by the suprarenal capsules of the kidneys when it is produced only in small quantities and so long as the suprarenal capsules remain intact. When this poisonous coloring matter is produced in great excess, the suprarenals are overworked, undergo degeneration and fail to do their duty, and so the poisonous pigment accumulates in the body and is deposited in the skin as well as in other parts. These pigmented spots are nearly always to be found in aged persons and are an indication of the degeneration which has taken place as a result of advancing age.

Their appearance in persons who are under the age of sixty indicates premature senility. They are likely to be associated with a thin, parchment-like, dry, inelastic skin, a condition which always indicates senile changes. These pigmented spots may often be made to disappear under the influence of an antitoxic diet and increased activity of the bowels. As they are always associated with chronic constipation or chronic colitis, it is necessary that the bowels

should receive special attention. The bowels should be made to move three or four times a day and the diet should be strictly antitoxic.

Jaundice

Q. **What is the cause of jaundice?**

A. Obstruction of some of the bile passages. The cause of the obstruction may be either gall-stones or inflammation of the bile passages. The cause in either case is infection which generally begins in the colon and works upward. In most if not all cases of jaundice as well as cases of gall-stones without jaundice there is incompetency of the ileocecal valve.

Diet in Jaundice

Q. **What should be the diet in jaundice?**

A. In cases of jaundice there is marked interference with the digestion of fats. No matter in what form fats are taken their absorption is greatly interfered with. Aside from this, jaundice appears to have very little effect upon digestion. The digestion and absorption of carbohydrates and protein are not materially impaired. Meat and eggs should be avoided.

Cause of Gall-Stones

Q. **What is the cause of gall-stones?**

A. The fact that gall-stones contain living bacteria, discovered by Gilbert now nearly twenty years ago, has completely changed the theory respecting the causation of these very troublesome bodies.

Mognot conducted a series of experiments which showed that the ordinary bacteria found

in the intestine, such as the colon bacillus and also the typhoid bacillus and various other bacteria, will cause inflammation of the gall ducts. He produced gall-stones experimentally at will by injecting bacteria into the gall-bladder. Five or six months were required for the formation of typical gall-stones. The evidence seems to be complete that gall-stones are only one of the manifestations of intestinal autointoxication. Bacteria may reach the liver and the gall-duct from the intestine, either by working their way up from the intestine through the biliary passages or through the blood vessels by absorption into the portal vein. The latter method is believed to be the most common. Experimental researches which have been made upon this point show that millions of bacteria are daily absorbed into the blood and circulated through the liver. The liver cells are able to deal with a certain number of bacteria and will destroy germs in great number. But it is evident that if the number of germs absorbed becomes greater than the liver is able to deal with many of them will escape destruction and thus find their way into the general circulation. This fact explains the presence of bacteria in the blood. It is evidently the best part of wisdom to take the greatest possible care of the liver.

Q. **Is there evidence that flesh eating is either directly or indirectly a cause of gall-stones?**

A. Gallstones are due to infection. A meat diet not only introduces putrefactive bacteria into the intestine but encourages their growth, and hence must tend to cause gallstones.

It has been shown by X-ray examinations that stasis or stagnation of the intestinal contents always coexists with gallstones.

DeLaugen (Java) now comes forward with an interesting observation which confirms this view in a most remarkable way. This physician has observed that gallstones are exceedingly rare in the East Indies. In 422,943 admittances to the dispensaries, gallstones were found in only 30 cases. Similar observations have been made by others, and it has also been noted that only very minute quantities of cholesterol are found in the blood of East Indians.. The explanation is found in the fact that the East Indian is a rice eater and not an eater of flesh.

Treatment for Gall-Stones

Q. **What is the treatment for gall-stones?**

A. The only method of removing gall-stones is by means of surgery. A radical operation may be now performed with little risk, although twenty-five years ago this operation was rightfully regarded as very hazardous. An operation is not necessary, however, in every case of gall-stones, as postmortem statistics show that gall-stones are found after death in about one-tenth of all cases examined, from which it appears that the great majority of people have gall-stones without being conscious of their presence. Gall-stones are due to infection and are probably one of the many consequences of chronic constipation.

Women suffer more from constipation than do men, and are more likely to have gall-stones.

For temporary relief a hot bath and fomentations over the region of the gall-bladder and a large hot enema, if necessary, are very useful measures.

It is quite possible that one who has once had gall-stones and has completely recovered may, by exercising due care, avoid recurrence. Meats of all sorts should be discarded; also tea and coffee. In other words, a thoroughly antitoxic dietary must be adopted. Thorough mastication of the food is essential, as first pointed out by Dujardin-Beaumetz nearly twenty years ago. Gall-stones are a protective measure, the purpose of their formation being to enclose the offending germs. Germs are always found in the center of gall-stones.

Water drinking is an excellent means of combating gall-stones. Four or five pints of water should be taken daily. The best time for taking water is half an hour before meals, and between meals, beginning two hours after eating. No harm is done by taking small quantities of water with meals, half a glassful to a glassful, provided care is taken to avoid drinking to wash down imperfectly masticated food. Great care must be taken to keep the bowels active. The bowels should move three or four times a day. A movement after each meal is the natural order.

In most cases of gall-stones, the gall bladder itself is diseased. Formerly it was the custom to remove the gall-stones and drain the gall bladder. Experience has shown, however, that sooner or later the gall-stones reappear or pain from chronic inflammation of the gall-bladder so that another

operation is required. On this account, it is generally considered best to remove the gall bladder with the gall-stones. The operation is not a hazardous one when done by an experienced surgeon. In many cases in which pain and other distresses are attributed to the stomach, the real fault is in the gall bladder and disappears when this organ is removed.

The X-ray has shown in recent years that in fully half the cases of chronic pain in the region of the stomach, the real trouble is not in the stomach but in the pancreas, duodenum or gall bladder.

The danger from an operation of this sort is, indeed, far less than results from the presence of gallstones in the gall bladder. The old method of opening the gall bladder and removing the stones, draining the bladder for a short time, and then allowing it to close up, is now practically abandoned by the best surgeons. A diseased gall bladder is of no use, and is best dispensed with. The risk of the operation, when skillfully done, is not greater than that involved in the removal of the appendix. The convalescence is short, and recovery so prompt and complete that the operation is rightfully regarded as one of the most useful of surgical procedures.

Another reason for the removal of a diseased gall bladder is that cancer not infrequently attacks this organ, particularly when gallstones are present; hence these products of disease should never be neglected, but when recognized should be gotten rid of as soon as practicable

The Cecum

Q. **What is the function of the cecum?**

A. The function of the cecum is to hold the very liquid foodstuffs for a few minutes after they have been received from the small intestine and to absorb a part of the water which they contain. After this has been done the cecum contracts and pushes the thickened mass up along the ascending colon. The peristaltic wave begins at the very tip of the appendix (Macewen) and extends upward along the bowel, carrying the condensed fecal residues around the hepatic corner of the colon, across the transverse colon, and "over the top" at the splenic flexure.

This action of the cecum occurs at frequent intervals while the small intestine is emptying into the colon. It is necessary to keep the way clear for the oncoming food residues from the small gut, and to prevent stagnation or "stasis."

The Pouched Cecum

Q. **What is pouched or dilated cecum?**

A. Many years ago Arbuthnot Lane of London, a world-renowned surgeon, called attention to the fact that the cecum was sometimes so overstretched and dilated that it formed a deep and capacious pouch, often filling the whole pelvic cavity. The thin walls of the dilated cecum are no longer able to contract, so the contents cannot be lifted out and pushed over the transverse colon and beyond, but stagnate, making of the cecum a veritable cesspool in which the food residues lie and ferment or putrefy, according to their nature.

The cecum in consequence is not only enormously enlarged, but is also in many cases adherent. This condition still further cripples the bowel, making normal emptying impossible.

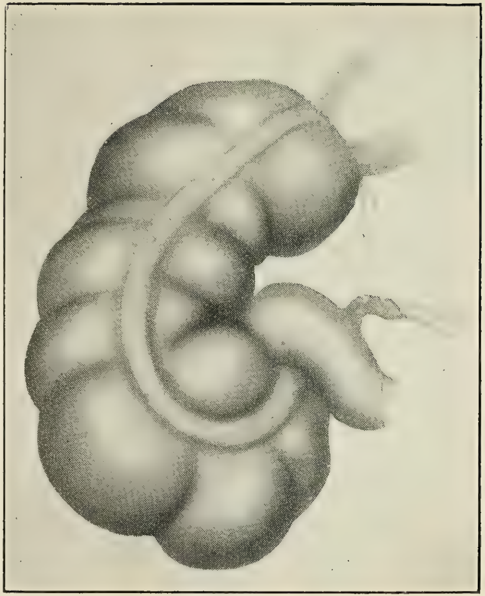
The cause of this condition is a spastic or contracted descending or pelvic colon, or a prolapsed and adherent pelvic colon, the result of constipation and colitis.

The only way in which the contents of the dilated, pouched, or adherent cecum can advance is by a sort of overflow. When the right limb of the colon becomes sufficiently distended some of the contents will be pushed over into the transverse colon and so the fecal matters slowly work along toward the exit; but the process is very tedious and, not infrequently, residues lie decomposing in the bottom of the deep cecal pouch for many days, even several weeks.

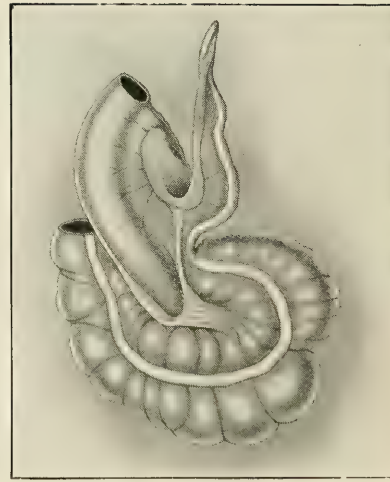
Dilated Cecum and Autointoxication

Q. **How may autointoxication be prevented when the cecum is dilated or adherent?**

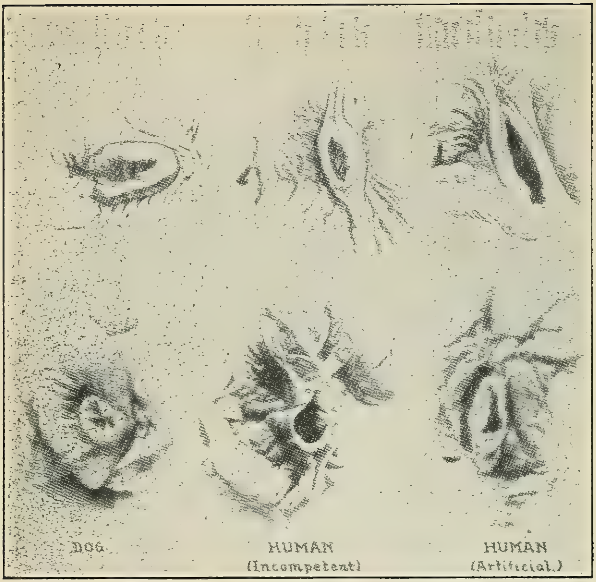
A. A person who possesses a dilated cecum is likely to suffer from very marked symptoms of autointoxication. A dingy complexion, coated tongue, bad breath, lack of appetite and neurasthenic symptoms are usually present. Headache, "bilious" attacks, obstinate constipation, and colitis are common symptoms. Pain, tenderness and a constant sense of weight and fullness in the right side, often lead the patient to fear appendicitis, and such patients often carry a scar as evidence that the appendix has been removed, but the symptoms remain. Indeed, not infre-



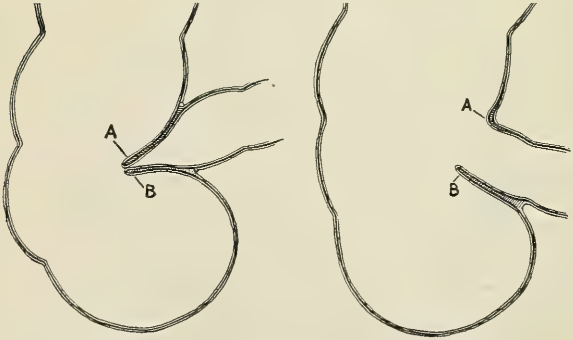
Human Cecum and Appendix



Cecum and Appendix of Chimpanzee



The Ileocecal Valve as Seen from the Inside of the Colon



Normal Ileocecal Valve   Incompetent Ileocecal Valve

(See page 721)

quently all the symptoms are aggravated by removal of the appendix, the cause being an increase of the binding adhesions..

An important factor in these cases is incompetency of the ileocecal valve. When the cecum is overstretched this check valve, which prevents the reflux of food residues into the small intestine is broken down and rendered inoperative, so that the putrefying contents of the cecal cesspool, together with the gases produced by decomposition, work back into the small intestine where they mingle with the digesting foodstuffs and are absorbed with them, producing the most pronounced symptoms of autointoxication. This condition is almost always found in X-ray examinations of persons subject to sick headache, gallstones, diabetes or profound neurasthenia.

Dilation of the cecum is a serious condition. The constant retention of putrefying matters imposes upon the liver and kidneys so great a task that they break down early and Bright's disease or cirrhosis of the liver is the result, as well as premature senility with high blood pressure due to hardening of the arteries.

A person who possesses a dilated cecum must attend closely to all the things necessary to secure thorough and frequent evacuation of the bowels. Bran, agar-agar, paraffin oil, a non-flesh diet, are among the essentials. The intestinal flora must be changed, that is, intestinal putrefaction must be prevented so that the stools cease to be highly offensive in odor. The bowels must move well three or four times daily.

In addition to these measures even when the

bowels move regularly and well, when it is known that a cecal pouch exists, a warm enema should be taken at least every other day habitually, preferably at night, so as to clear out the cecal pouch. At least three pints of water should be used. Sometimes a second or even a third enema is required. The water should be introduced slowly and with the patient lying down so as to make sure that the cecum is filled.

In very extreme cases surgery may be resorted to, but such cases are very exceptional. The only surgical method likely to afford radical relief is removal of the cecum and ascending colon. The small intestine is joined to the transverse colon and an artificial ileocecal valve is constructed. By this thoroughgoing surgical procedure complete relief is possible, but the operation is a serious one and only to be undertaken when all other means fail.

The Intestinal Villi

Q. **What is the function of the villi of the small intestine?**

A. The alimentary canal is divided by the biologist into three parts, the fore-gut, which comprises the mouth to the stomach; the mid-gut, which consists of the small intestine; and the hind-gut, which consists of the colon.

The work done by these individual sections of the alimentary canal differs very greatly. The fore-gut prepares the food for the real work of digestion, which is performed in the small intestine. The stomach may be thus regarded as the kitchen or preparatory laboratory. The small

intestine is analagous to the dining-room, and in this part of the digestive tract the food is not only completely digested, but is also completely absorbed.

The function of the colon is simply to receive and discard from the body the food remnants and body wastes.

With these facts in view, it is evident that the small intestine is the organ of chief consequence to the body from the standpoint of nutrition, and, indeed, it provides the soil out of which the body grows. The surface of the small intestine is everywhere covered with minute villi, hair-like processes which hang out into the cavity of the intestines and are bathed by the fluids passing through it. There are some 5,000,000 of these minute absorbent organs. In the course of a lifetime of sixty years, each villus absorbs about one ounce of fluid. This is its lifetime job.

To absorb one single drop of fluid, a villus must work unceasingly day and night for almost an entire month.

These facts help the mind to grasp the exceeding minuteness and delicacy of the bodily machinery and the importance of keeping this delicate mechanism in perfect working order. Drastic laxatives and such irritating substances as saline aperients, mineral waters, cascara, senna, castor oil, and similar drugs, congest and cripple the mucous membrane of these delicate villi and interfere with their work, which is so essential to the welfare of the body.

Peristaltic Action

Q. **How are the movements of the stomach and intestines produced and maintained?**

A. The movement of the stomach and intestines are controlled by certain automatic centers, some of which are located in the spinal cord, and others in the walls of the stomach and intestines. The accompanying cuts show the changes which take place in the form of the stomach, as a result of the peristaltic waves which pass over it three to five times a minute.

The Small Intestine

Q. **Is the small intestine indispensable?**

A. The essential part of the digestive apparatus is the small intestine and the glands connected with it.

Modern studies of the alimentary canal have shown that the small intestine does nearly all the work of digesting and absorbing foodstuffs. The small intestine is the only portion of the digestive apparatus which is capable of digesting all of the essential natural foodstuffs. It digests every digestible element of food with the exception of raw meat. It can digest cooked meat, but not raw meat. Raw meat must be digested, in part, in the stomach before it can be completely digested in the small intestine.

The stomach is so little essential to life and health that it may be completely removed without disturbing digestion or nutrition. All but a very small portion of the organ has been removed in a great number of cases, the occasion for the operation being the development of cancer in the

stomach. Life has been very greatly prolonged by this radical operation. In a few instances, the entire stomach has been removed, and the patients have survived for many years in health.

The large intestine takes practically no part in the work of digestion. It is simply a receptacle for the food residues, the indigestible and unusual remnants which are rejected by the small intestine; it is also an avenue through which certain waste matters escape from the body, particularly lime and other mineral wastes.

It is an interesting fact that while the small intestine is not only the most useful and essential part of the digestive apparatus, it is also the part which is least likely to become the seat of disease. This is particularly true with reference to cancerous disease, the most formidable malady which attacks the digestive tract.

Carefully kept hospital statistics have shown that 40 per cent of all cases of cancer affecting the digestive tract have their seat in the stomach; 53 per cent of cancers in this part of the body are found in the colon, leaving only 7 per cent for the small intestine. This, notwithstanding the fact that the small intestine constitutes by far the largest part of the alimentary tract, its length being about twenty-two and one-half feet, approximately five-sevenths of the total area of the digestive tract.

These facts led Metchnikoff to the conclusion that the stomach and the colon would be good organs to be rid of. He, in fact, held that the tendency to degeneration is the result of an

evolutionary process which may ultimately eliminate the stomach and the colon from the human anatomy. He cites the case of the tapeworm, which has lost its digestive organs altogether, because it has no use for them, living in the intestine of another animal and absorbing the nutritive material prepared by the digestive juices of its host.

Primitive man lived upon crude and rough materials which he took straight from the hand of Nature. Our cultivated plants, prepared by cookery, are so easily digestible as to require much less work on the part of the stomach than the foodstuffs eaten by our primitive ancestors, so that the demand made upon the stomach may be much diminished, though the lack of indigestible residues in our foodstuffs deprives the colon of its natural stimulus to activity.

The remedy suggested by Metchnikoff was that our digestive organs be adapted to the modern dietary by removing the colon, and he even intimated that the stomach, also, might be gotten rid of with advantage. The operation of the removal of the colon has been performed by Lane and his followers in some hundreds of cases, but the results have not been satisfactory.

Metchnikoff seems to have overlooked the fact that there exists a much simpler and more practical method of reconciling the disharmony between our modern dietary and our anatomical structure; namely, a return to the simple dietary of our prehistoric forebears. This, indeed, would seem to be the natural and obviously the proper method of adjusting the disharmony.

How to Change the Intestinal Flora

Q. **How can the intestinal flora be changed?**

A. To change the intestinal flora three things are essential:

1. To regulate the diet so that there will be left in the colon no putrescible food residues. This is accomplished by eliminating from the diet for a few days all animal proteins, that is, meats, milk, and eggs, and also vegetable foods rich in protein, such as beans, peas, and cereals. Fats are also excluded, because they delay the movement of the food through the stomach and small intestine and encourage putrefaction in the colon. A diet consisting wholly of fruits and green things is best with 8 to 10 ounces of milk sugar or 12 ounces of meltose taken in three portions, well diluted.

2. The activity of the bowels must be increased to such a degree that the food residues will not be retained in the colon long enough to undergo putrefaction. This requires three or four bowel movements daily, at least one bowel movement after each meal. By the free use of bran or agar-agar and paraffin oil in some form, spontaneous movements may usually be secured. The colon should be emptied by a thorough enema once or twice a day.

In children and in some adults who enjoy superb health, the bowels move four times daily; before breakfast, after breakfast, after dinner, and at bedtime.

The idea entertained by many persons that frequent bowel movement is weakening, is wholly

erroneous. The bowels move often in cases of diarrhoea for the purpose of carrying away poisons produced in the intestine by invading germs. The weakness felt is not due to the bowel movements but to the poisons, some of which are absorbed in spite of Nature's efforts to eliminate them.

3. A third factor of importance, though less essential than the preceding, is the introduction of protective organisms, the lactic acid-forming ferments or so-called buttermilk germs. The *B. Bulgaricus* recommended by Metchnikoff has been much used, but later experience has shown that the best protective germ is the *B. Acidophilus*, which is a native of the normal colon. These cultures are now obtainable.

In very chronic cases and when rapid results are desired, the cultures should be used both by enema and by mouth, thus planting the protective germs where they are most needed and may render the most effective service.

The combination of these methods constitutes the "Fruit Regimen," a few days of which rarely fails to clear the tongue, sweeten the breath, and dissipate the foul odor of the stools which become odorless or acquire a slightly sour odor.

When the tongue has been cleared, the "Milk Regimen" may be utilized with great advantage as a means of fixing in the intestines the protective germs.

Bowel Rhythm

Q. **How often should the bowels move?**

A. The normal rhythm of the bowel movement requires an evacuation after each meal. This is the rule with animals, infants, and primitive people. One a day or once in a while is the rule with most civilized people. If the bowels can be induced to move two or three times daily by natural means great advantage will be gained, as less opportunity will be given for the formation and absorption of intestinal poisons.

How to Avoid Laxatives

Q. **How can one secure three movements of the bowels daily?**

A. In most cases the bowels may be made to move three times a day regularly by observing the following rules:

1. Give the bowels an opportunity to move after each meal.
2. Observe regularity of meals.
3. Make each meal consist of bulky vegetable foods, that is, foods containing a considerable amount of cellulose. Fresh vegetables, both raw and cooked, should constitute a part of every meal. In fact, they should constitute the great bulk of the food.
4. In most cases it is necessary to increase the bulk of the food by the addition of bran or agar-agar.
5. In a large proportion of cases it is necessary to make use of paraffin oil in some form, to lubricate the alimentary canal.
6. At first it may be necessary to use a small cool enema at 80° to 70° F. once a day to re-

store the normal sensibility and tone of the bowels.

The Pituitary Gland

Q. **What is the function of the pituitary gland?**

A. This is a curious body located at the base of the brain. It is small in size, but possesses wonderful control over nutrition and development. The anterior part of the gland controls the growth of the skeleton through a hormone secreted by it. The posterior part has a like control over the fatty tissues of the body.

Irritation of the anterior lobe causes gigantism and overgrowth of bones in various parts. A deficient development of the posterior lobe leads to a peculiar form of obesity. The body fat is deposited irregularly, accumulating in masses about the hips, abdomen, mammary gland, or base of the neck. Dieting does little good in these cases. Dried pituitary must be given.

Functions of the Thyroid Gland

Q. **What are the functions of the thyroid gland.**

A. The thyroid gland is a so-called antitoxic gland. This is, its duty is to supply a secretion which aids in the destruction of poisons, especially the poisons which are absorbed from the intestines. The thyroid gland also regulates the functions of the skin and has a very important relation to nutrition in general. Mental development and growth appear to be influenced in a

very important way by it. When this gland is deficient in children, cretinism appears.

Myxedema

Q. **How can the damaged thyroid gland be stimulated?**

A. By cold baths, massage of the thyroid gland, applications of electricity and local light baths. Of chief importance, however, in the adoption of a diet which will tax the thyroid as little as possible. This requires a strict anti-toxic diet and highly laxative diet. The bowels should be made to move fully three or four times a day.

The Appendix

Q. **Is the appendix of any use?**

A. Yes. The appendix is a part of the lubricating apparatus of the colon. Like any other piece of machinery, the colon needs lubrication. Nature provides a highly efficient lubricating material, mucus, wherever there is any possibility of friction, as in the mouth, the stomach, the small intestine, the colon and the rectum. At the head of the colon is placed the appendix (see cuts), a big mucous gland or follicle. Prof. Macewen of Edinburgh, many years ago noted that when a contraction wave passes over the colon it starts with the tip of the appendix.

The purpose of this arrangement is evident. Before the colon begins to push along its contents, a film of liquid mucus is spread over the mass so that it may slip easily along over the

surface of the mucous membrane, thus preventing the clogging which might easily occur at kinks and corners, in pockets and folds. Mucus is also secreted all along this lining surface of the colon by numerous glands, but the appendix is a special and most active lubrication which operates in synchronism with the colon, storing up a spoonful of mucus and then doling it out at just the right time and place to make it most effective.

In the light of these facts, it is easy to understand how the removal of a healthy appendix might tend to produce constipation by crippling the lubricating system of the colon. Of course this is not true of a diseased appendix. A diseased appendix, like a diseased tonsil has lost its usefulness and has become a useless member of the bodily household and must be "scrapped," and the sooner the better.

The Thyroid Gland as a Remedy

Q. **In what cases is the use of dried thyroid gland indicated?**

A. Persons whose thyroid glands are inactive—the condition of so-called hypothyroidism, are benefited by the use of dried thyroid gland (sheep's thyroid). There are numerous indications of this condition, among which are dryness of the skin, pigmentation and atrophy of the skin, and falling of the hair with other symptoms. It is important, however, to note that when taking dried thyroid a thoroughly anti-toxic diet must be adopted, that is, meats must be entirely discarded, while milk should be taken only in the

form of buttermilk, and in some cases even buttermilk must be avoided. Eggs must also be omitted from the dietary. Fresh vegetables and especially uncooked fruits and vegetables should be freely used. Tonic baths, an outdoor life and free water drinking are other measures important in such a case.

Poisonous Effects of Tobacco, Alcohol, Tea and Coffee

Q. **Has science really demonstrated that alcohol, tobacco, tea and coffee are as injurious as they are claimed to be?**

A. Doctor Rivers, of Cambridge University, Professor of Experimental Psychology, has recently published the results of a new series of experiments made by him which furnishes most positive evidence of the harmful effects of alcohol, tobacco, tea and coffee upon strength and endurance, both mental and muscular. Every possible precaution was taken to prevent error, so that the results are apparently incontrovertible.

Some of the experiments were made with an ergograph, an instrument by means of which muscular work may be accurately measured.

In order to prepare himself for his task, Doctor Rivers renounced the use of all the drugs for an entire year before he began his experiments.

The effects of tea and coffee were found to be decidedly poisonous. Says Doctor Rivers: "Caffein, the active principle of coffee and tea, may be legitimately spoken of as an accelerator of fatigue." On this account Doctor Rivers condemns tea and coffee as dangerous in cases of

prolonged exertion, and especially in neurasthenia, in which there is a chronic "enhanced tendency to fatigue." This is especially important for neurasthenics, who are decidedly prone to the use of tea and coffee on account of the temporarily agreeable effects of these drugs in obliterating the sense of fatigue, one of the chief distresses of neurasthenics.

The effect of alcohol was "a decided falling off in the amount of work done." The evidence also pointed to decrease of mental work.

The effect of tobacco upon muscular work was found to be "most unfavorable." One instance is cited in which an eminent physiologist who had been addicted to the use of tobacco found a decided increase "in energy and power for work" on giving up the use of the drug.

Alcohol and Race Degeneracy

Q. **What are the effects of alcohol upon the race?**

A. Alcohol is the plague of civilization. It is a deadly enemy of religion, morality, health, and prosperity. It is the poison which strikes deeply into the roots of personal life, home life, civic life, and national life. Alcohol is a race poison that blights the lives of unborn infants. It is a pitiless scourge, the destructive effects of which do not end with the drunkard, but are passed on to the third and fourth generations of his posterity.

It is known that alcohol is not a stimulant, but a narcotic. A pint of beer impairs intelligence and weakens the memory. The most minute doses of alcohol injure judgment and the rea-

soning faculty. Alcohol lessens endurance. Experiments upon animals and men have shown that alcohol even in small doses lessens the power to resist disease.

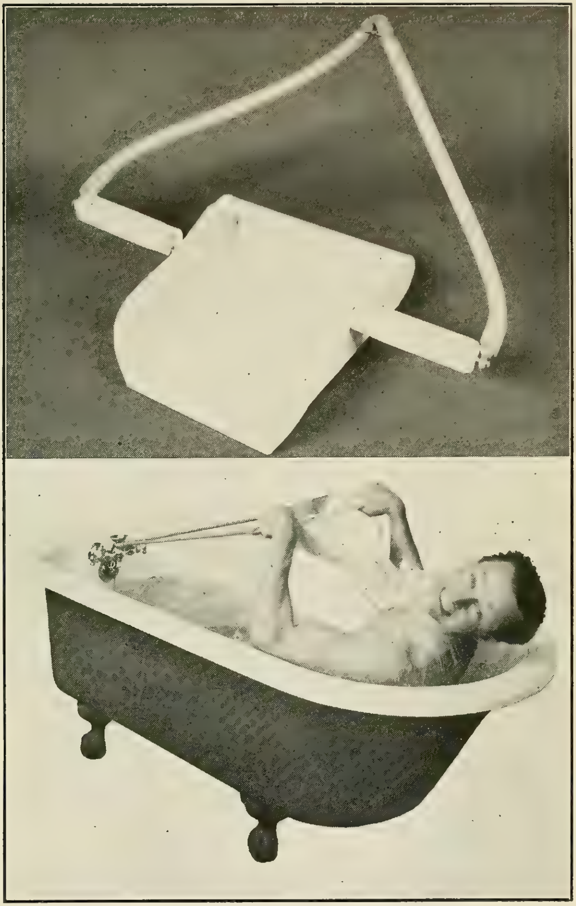
We fight germs with our blood corpuscles. A pint of champagne puts 20 per cent of our blood cells out of commission. The saloon is in league with the brothel in destroying our modern civilization. Our insane asylums are filled with the progeny of these monsters. Statistics show that 20 per cent of the inmates of our asylums owe their insanity directly to the use of alcohol. Twenty per cent are due to syphilis. 50 per cent are traceable to heredity, half of which is due to alcohol and vice. Alcohol is a monster which claims its victims not once a year, but every day and every hour. A continuous procession of men, women and children are being momentarily sucked into the maw of this demon of destruction. The annual crop of lunatics, idiots, imbeciles and epileptics due to alcohol and allied causes is growing faster than the progeny of the sane and sound. We already have an aristocracy of lunatics, idiots, embeciles, and epileptics numbering more than a million, supported at a cost of one hundred million dollars annually, and multiplying fast. The time has come for intelligent men and women who love humanity and who are concerned about the future welfare of the race, to rise and combat this enemy of humanity.

The Heredity of Alcoholism

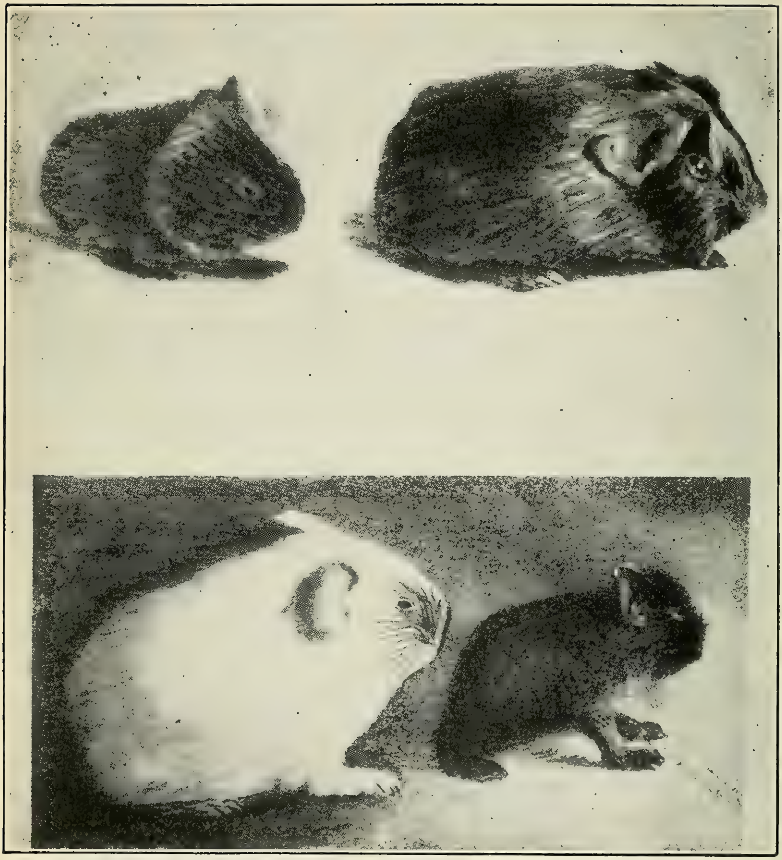
Q. **What has been scientific proof with reference to the hereditary effects of alcohol?**

A. Dr. Stockard, of the Cornell Medical School, has for several years conducted experiments upon guinea pigs for the purpose of determining the effects of alcohol. He has found that when one parent is normal and the other has had alcoholized grandparents, "numerous defective offspring result. It is a significant fact that defective offspring never appeared among the normal guinea pigs. The difference between the normal and defective young is very striking, as a comparison of the individuals shown in the photographs, shows. The large white guinea pig and the puny little dark one were born in the same litter. The father was a normal albino, while the mother was derived from four alcoholized grandparents. The white guinea pig on the left weighed 90 grams at birth, while "her small degenerate brother on the right weighed only 38 grams at birth, had a severe tremor which rendered him incapable of normal progressive movements, and he lived only two days." Such a marked discrepancy either in size or condition between two members of the same litter at birth never appeared among the normal untreated animals of Stockard's stock.

"The upper left hand photograph shows the degenerate descendent of alcoholized ancestors. Six of her eight grandparents were treated with alcohol, while only the two grandparents on the paternal side were not treated. A comparison



The Bath Exerciser, or Surf Bath
(See page 590)



The Inheritance of Alcoholism
—*Courtesy of Dr. C. R. Stockard and the Wistar Institute.*

of this animal with a normal animal born on the same day (upper right hand figure) shows clearly how small and degenerate she is. She weighed only one-third as much as the normal, 'control' guinea pig."

Dr. Spaeth, from whom the above paragraphs are quoted, summarizes the experiments on fowls conducted by Dr. Pearl of Johns Hopkins University, as follows:

"That the germ cells of the birds were affected by the alcohol, Dr. Pearl feels assured. The effect is shown in the lower percentage of fertile eggs produced by the treated birds. Alcoholized hens gave only one-half as many fertile eggs as the normal hens. In the same way, normal hens mated with treated roosters gave a smaller number of fertile eggs."

Alcohol and Nutrition

Q. **Does alcohol aid nutrition?**

A. When alcohol is introduced into the stomach it produces a profuse flow of mucus the purpose of which is to protect the mucous membrane from the irritating effects of the alcohol. Alcohol also stimulates the glands which produce hydrochloric acid.

The toxic effects of alcohol are shown in a very striking way by its influence in hindering the formation and accumulation of glycogen in the liver, thus lessening resistance to infection.

The question of the food value of alcohol has been warmly discussed. For a long time there was very great divergence in the results

obtained by various experimenters, but within the last few years there has come to be a general concurrence in the opinion that alcohol can not be considered in any proper sense a normal foodstuff. The experiments of Atwater and others show clearly enough that alcohol is oxidized or metabolized in the body, but the same is true of opium and nearly all other organic substances. Anything that will burn will produce heat. Anything that will combine with oyxgen under the conditions in which oxygen is found present in the body, whether in the alimentary canal, the blood or the tissues, will give rise to heat; but this is not normal heat metabolism. The formation of heat in the body takes place in connection with cell activity.

Alcohol in Shock and Collapse

Q. **Should alcohol be given in cases of shock or fainting?**

A. When a person faints, or is in a state of shock, the action of the heart is weak and the blood pressure is low.

The common habit of administering alcohol to persons in a state of shock or collapse from hemorrhage or accident, or a person who has fainted away, has been shown by recent investigations to be almost the worst thing that could be done. In case a person has suddenly fainted away, the pouring of a few drops of alcohol down the throat, or even the administration of a few spoonfuls of brandy diluted with water does apparent good.

The apparent beneficial results following the administration of alcohol in such cases are

caused by the irritation produced by alcohol when it first comes in contact with the mouth and stomach. Alcohol is highly irritating to the sensitive nerves of the mucous membrane, and the irritation or excitation thus produced is followed by a slight stimulating effect. But this disappears very quickly, for as soon as the alcohol is absorbed, its narcotic or depressant effects begin to make their appearance. Then the vessels dilate, the heart's energy is weakened, and the pernicious effects of the drug become manifest. This fact is now so well recognized that railway surgeons instruct employees to be very careful to avoid giving alcohol in cases of serious accident, as the effect of the drug may be to take away from the victim of a railway smashup his one remaining chance for life.

Effects of Alcohol

Q. **What are the effects of alcohol upon the body?**

A. Sometime ago, a committee of fifty, consisting of eminent chemists, physiologists, pharmacologists, and clinicians, after three years devoted to careful study of the alcohol question published a report which may be briefly summarized as follows:

(1) Alcohol, even if it may be tolerated in small doses by healthy men for a considerable length of time, can not be shown to be capable of supplying any property of special or characteristic value.

(2) Alcohol is a poison,—a deadly poison in large doses, and a slow insidious poison in small doses.

(3) Alcohol in all doses diminishes muscular vigor, nerve sensibility, and vital endurance.

(4) Pure alcohol in large doses produces immediately and in a marked degree a retarding effect upon digestion, while in small doses its effect is such that it can not be said to be in any respect an aid to the digestive process.

(5) The seeming stimulating effect manifested in one direction is counteracted by an equally retarding effect in another direction. Beer and wine retard digestion in all appreciable doses, producing in this respect an effect even greater than whiskey and stronger liquors.

It must be evident to any thinking person that a drug which produces the effects described above upon a healthy person, could not be expected to do a sick person any good.

Alcohol and Disease

Q. **To what extent is alcohol known to be a cause of disease?**

A. Statistics show that 20 per cent of cases of insanity found in our asylums may be traced directly to the use of alcohol. Idiocy and imbecility have also been placed to the same cause. This would place two hundred thousand out of the million defectives to the discredit of alcohol.

Alcohol is directly the cause of a vast amount of disease, instead of being, as many suppose, a preventive. If alcohol were a preventive of disease, then those who use it ought to be the most healthy; but we find the contrary to be the case. The liquor-drinker, instead of living longer than the teetotaler, as he ought to

do if this theory were true, lives, on an average, after reaching adult age, only one-fifth as long as the abstainer, as shown by life-insurance statistics.

The Influence of Alcohol Upon Longevity

Q. **Does the use of alcohol shorten life?**

A. At thirty years of age the temperate man may expect to live thirty-six and one-half years, while the dram-drinker will die in less than fourteen years, a loss of nearly two-thirds.

A London Life Insurance Society divides its insurers into two classes, abstainers and moderate drinkers. It is found that during the last twelve years the mortality of abstainers has been one-fourth less than among the moderate drinkers; that is, only three abstainers die to four moderate drinkers.

Dr. Willard Parker, of New York, showed from statistics that for every ten temperate persons who die between the ages of twenty-one and thirty, fifty-one intemperate persons die.

Alcohol not a Stimulant

Q. **Is alcohol a stimulant?**

A. Alcohol was formerly regarded as a valuable stimulant. Its use was thought to be necessary in all cases of depression or vital exhaustion. It is now known to be a narcotic. It depresses, it does not stimulate.

James Miller, in his work on alcohol, says: "Alcohol to the working human frame is as a pin to the work of an oil-lamp. With this, you raise the wick from time to time, and each raising may be followed by a burst of brighter

flame; but, while you give neither cotton nor oil, the existing supply of both is, through such pin-work, all the more speedily consumed."

Alcohol and Digestion

Q. **What is the effect of alcohol on digestion?**

A. Alcohol in so dilute a form as one part to 250 of water, or less than one-half of one percent, hinders the formation and the action of the gastric ferments. Wine and beer produce still more deleterious effects than dilute alcohol, for the reason that they contain various ethers and other substances which paralyze the ferments as do chloroform and ether.

Alcohol Not a Curative Agent

Q. **Has alcohol any value as a curative agent?**

A. The verdict of modern science respecting the use of alcohol in disease may be briefly summed up as follows:

(1) Alcohol never, under any conditions, increases the vital energy of the body, but, on the contrary, decreases it in a marked and uniform manner, through its poisonous influence upon the living cells.

(2) Alcohol is never a tonic or stimulant. It is always a narcotic, interfering with the bodily functions and lessening the nerve tone and vital energy.

(3) Alcohol always diminishes, never increases, the energy of the heart, and hence is detrimental rather than beneficial in cases of shock, collapse, fainting, etc.

(4) Alcohol increases the liability to infec-

tious disease, and prevents the development of immunity.

(5) Alcohol does not aid digestion, but actually hinders it, especially in cases in which the digestion is already weak or slow; hence its use in connection with meals is absolutely unscientific and irrational, as well as its use as an aid to feeble digestion.

(6) Alcohol diminishes the alkalinity of the blood, and so diminishes vital resistance and increases susceptibility to disease.

In view of the above facts, no apology can be offered for the use of alcohol in medical practice. So far as the writer is himself concerned, he is glad to be able to say that during a practice reaching over many years' experience in the profession, and more than forty years in charge of a large medical institution, he has found no use for alcohol. In the treatment of the scores of thousands of patients who have visited this institution, not a single dose of alcohol in any form has ever been administered as a curative agent.

Tobacco

Q. **Is tobacco injurious, and in what way?**

A. Very few users of this noxious weed need to have a description of the effects of a moderate degree of poisoning with tobacco. The giddiness, nausea, and deathly sickness following the first attempt to use it are indubitable evidences of the poisonous character of this drug. In severe cases of poisoning violent vomiting, purging, vertigo, deathly pallor, dilatation of pupils, disturbed heart-action, staggering gait, difficult breathing, and in extreme cases uncon-

sciousness, are commonly observed. These symptoms are produced by a very small quantity of the drug in persons not accustomed to its use. One reason why so few persons are reputed to die of nicotine poisoning is the wonderful faculty the system possesses of accommodating itself to circumstances. In this way the worst poisons may by degrees be tolerated until enormous doses can be taken without immediate fatal results. In the writer's opinion, the majority of tobacco users do die of tobacco poisoning. A man who dies five or ten years sooner than he should as a consequence of tobacco using, is killed by the poison just as truly as though he died instantly from an overdose.

Hereditary Effects of Tobacco

Q. Are the effects transmitted to the offspring?

A. There is probably no vice or habit to which men are addicted, the results of which are more certainly transmitted to posterity than are those of tobacco using. A vigorous man may use tobacco all his life, and be able to convince himself all the time that he is receiving no injury; but the children of that man, who should inherit from him a vigorous constitution and high health, in most instances are robbed of their rightful patrimony, and enter upon life with a weaker organism, with a system predisposed to disease and destined to premature decay.

General Effects of Tobacco

Q. What is the effect of tobacco using?

A. Probably not one in a thousand of those who use tobacco has any conception of the mis-

chief which is being done in his body by this baneful drug. Tobacco, like every other narcotic, benumbs the nerves, producing a sort of artificial felicity. The influence which relieves worry and dissipates the sense of fatigue, at the same time lessens the activity of the mind, weakens the will, slows the heart, and impedes the movements of all the bodily machinery.

John Ruskin declared tobacco to be "the worst natural curse of civilization;" adding, "It is not easy to estimate the demoralizing effect on the youth of Europe of the cigar in enabling them to pass their time happily in idleness."

Tobacco using undermines the constitution, weakens the will, and blunts the conscience. It is a plague against which the voice of every friend of humanity should be raised in earnest protest.

Cure for Tobacco Habit

Q. **What will cure the tobacco habit?**

A. The only cure for the tobacco habit is to stop using tobacco. Substitutes of all sorts are a snare and a delusion. There is no drug which will take away the appetite for tobacco which is not equally as bad or worse than tobacco itself. Daily swabbing the mouth with a one-half per cent solution of silver nitrate sometimes succeeds.

Effects of Tobacco Upon the Heart

Q. **What is the effect of tobacco on the heart and vascular system?**

A. Tobacco paralyzes the heart, and gives rise to what is known as "tobacco heart." A man suffering from tobacco heart is short of breath. He is unfit for any exercise likely to

put a strain on the heart; it is for this reason that runners and athletes in general are forbidden the use of tobacco when preparing for a contest. The effect of tobacco on the blood-vessels is shown by the fact (stated by Professor Janeway, of New York, an eminent authority on diseases of the heart) that a single cigar will, in thirty minutes, produce a rise of blood-pressure amounting to twenty points.

Tobacco and Blood Pressure

Q. **What is the effect of tobacco upon the blood pressure?**

A. Tobacco always raises the blood pressure. In an experiment upon a young man, an habitual smoker, it was found that the blood pressure rose twenty-five points in twenty minutes after the young man had smoked three cigarettes. An hour elapsed before the blood pressure returned to normal. It is thus evident that smokers who repeat the indulgence several times a day in so doing keep the blood pressure constantly above normal.

"Both in frogs and mammals," says Sir Lauder-Brunton, "nicotine produces, first convulsions and then paralysis. When applied in small doses to the frog's heart it causes the beat at first to become slow and afterwards to become quick. If the dose be large, no primary slowing may be observed. In mammals it causes a slowing of the heart with enormous rise of blood pressure."

Nicotine and Nerves

Q. **What is the action of nicotine on the general nervous system?**

A. Nicotine is a poison. Under all circumstances it is a narcotic poison and deadens the sensibilities of the brain and nerves. It is this property, indeed, which has enabled this ill-smelling weed to win its way into popular favor. When a person is tired, the smoking of a cigar dissipates the sense of fatigue by benumbing the sensibility of the nerves of fatigue. If a person is worried he forgets the causes of his worry under the lethal influence of a pipe or cigar through the benumbing of his mental and moral sensibilities. The tobacco habit, if long continued, greatly injures the entire nervous system, sometimes producing blindness through tobacco amaurosis. The use of tobacco entails the use of an enormous waste of nervous energy.

Elimination of Tobacco

Q. **If one has chewed tobacco and smoked a great deal for a period of thirty years or more, how long does it take to eliminate the nicotine from his system?**

A. It does not take very long to get the nicotine out of the body. Perhaps ten days or two weeks, but it takes a long time to repair the damage done and often the damage never can be wholly repaired. It is just as it is with a house afire. It may not take long to put out a fire, but it may take weeks and months to repair the damage done by the fire.

Athletes and Tobacco

Q. **Why do long-distance runners abstain from tobacco?**

A. Hays, the famous long-distance runner who was the winner in the Olympic games for 1908, says:—

"So far as the diet and similar conditions are concerned, one thing is essential; abstinence from tobacco in any form. No long-distance runner can smoke either cigars or cigarettes and run. Smoking affects his lungs and heart, and the more he runs the less he will care for it. I suggest running as a certain cure for the tobacco habit to any one who wishes to break himself of it."

Tobacco Poison

Q. **Is it true that one pound of dry tobacco leaves contains enough poison to kill three hundred men?**

A. One pound of market tobacco contains about 350 grains of nicotine. One-thirtieth of a grain causes toxic symptoms in man. One drop kills a dog. Nine-tenths of a grain will kill a man. One pound of tobacco, then, contains more than enough to kill three hundred men.

Smoking and Eyesight

Q. **Does smoking injure the eyesight?**

A. Many persons who are accustomed to smoking, endeavor to make themselves believe they are receiving no harm therefrom. The following simple experiment is a test that will demonstrate in a very ample manner the poisonous effects of the drug:

Say to the smoker, "Look out the window; now shut your eyes and look over against the wall." He sees a picture of the window, but the colors are reversed. He sees the complementary colors. If he is looking at blue, for example, when he shuts his eyes he will see red, or some shade of red or green. Now observe how long it takes those colors to disappear from the eye; how long it takes the picture of the window that is in the eye to disappear. It ought to disappear in a few seconds, but if one has been smoking, it takes sometimes as long as fifteen minutes. The reason for this is that the smoker's eye is paralyzed in such a way that the picture remains an excessively long time. The smallest amount of tobacco is a poison.

Tobacco Chewing and Teeth Decay

Q. **Does chewing tobacco preserve the teeth?**

A. No. Tobacco possesses no preservative qualities. Nicotine is not a good disinfectant. Chewing tobacco cannot be recommended as a preservative of the teeth. It is not at all likely, indeed, that any one ever used tobacco for this purpose. The claim that tobacco preserves the teeth has been presented as an apology for the use of this noxious and filthy weed.

Evils of Cigarettes

Q. **Are the evils of cigarettes exaggerated?**

A. Tobacco injures men, and kills children. At one time the Chicago school board had been having a medical examination of certain pupils before allowing them to take part in certain ath-

letic sports. Boys and girls were subjected to the same examination. Not one girl was found unable to pass, while a large number of the boys, in almost every case smokers, were found to be in a physical condition which made violent exercise of any kind very dangerous. Twenty-one out of a hundred were found unfit, and all but three suffered from some form of heart trouble. Almost without exception, the unfit ones were cigarette smokers.

Cubeb Cigarettes

Q. **Are cubeb cigarettes injurious, and if so, how?**

A. Yes. Cubebs are a drug, and there is certainly no reason why they should be used in the form of cigarettes or otherwise. The habitual use of a drug of any kind is damaging.

When Renouncing Smoking

Q. **What means should be employed to avert the uneasiness which one feels upon discarding smoking?**

A. Prolonged warm bath at 92° F., taken at night, twenty to forty minutes. Cold towel bath on rising in the morning. Moist abdominal bandage to be worn at night, and also during the day if necessary. A short sweating bath two or three times a week is also helpful. Meats should be discarded, as a flesh diet encourages the appetite for tobacco. Eat plenty of juicy fruits, fresh vegetables, bran and coarse breads.

Tobacco Smoke

***Q.* Is there any direct scientific proof that tobacco smoke is poisonous?**

A. Prof. Molisch, an eminent German scientist after prolonged and careful research has demonstrated that tobacco smoke is highly injurious to plants.

"Very young seedlings of vetch (Vicia sativa), about 1-10 inch high, were placed on a piece of tulle, which was stretched over the mouth of a jar so nearly filled with water that most of the roots were immersed, while the stem and seed leaves were above the tulle. A large vessel of more than one gallon capacity was inverted over the jar, with its mouth resting on a plate and sealed by a shallow layer of water. The operation of covering the jar with the beaker was conducted in front of an open window, in order to fill the vessel with pure air. The beaker was then slightly tipped and three mouthfuls of tobacco smoke were blown into it through a bent glass tube. Another jar similarly planted and covered, but not smoked, served as an object of comparison. Both beakers with their contents were covered with zinc covers which completely excluded the light, and were kept in the greenhouse at a temperature of 60° to 65° F. Six days later the plants in the left-hand jar, which had been exposed to the smoke, were greatly stunted and their thick stalks grew obliquely, horizontally or even downward, while their buds showed scarcely a trace of the red tint of anthocyan which tinged most of the buds of the plants which had grown in pure air.

Prof. Molisch reached the very sensible conclusion that "if the living substance of plants is so strongly affected by very small doses of tobacco smoke it is hardly credible that saturation of the mouth and the organs of respiration with tobacco smoke, continued many years, can be entirely free from injurious effects."

The Snuff Habit

Q. **What are the effects of snuff taking?**

A. The systemic effects of snuff taking are the same as those of tobacco taken in any other form. In addition the sense of smell is destroyed through the chronic catarrh induced, the sense of taste is impaired, and the sight may be seriously affected. This dirty habit is certainly much less common than in former times, and on the whole it is less injurious to the general public than either tobacco chewing or smoking, the effects being practically confined to the user.

The Cost of Smoking

Q. **Is there any means of knowing the cost of tobacco to the people of the United States?**

A. In 1915, according to the census bureau, revenue was paid on 18,000,000,000 cigarettes, and in 1916 on 25,000,000,000, 250 cigarettes for every man, woman and child in the United States, an increase of 40 per cent. The number of cigarettes manufactured in 1918 was 40,000,000,000. The increase is supposed to be due to the war and to an increase in the use of cigarettes by women.

The cost to the consumer of these billions of cigarettes, with other forms of tobacco, is esti-

mated by Prof. Farnum, professor of political economy in Yale University, as not less than $1,200,000,000, or three times the amount paid for education in this country.

If this amount of property had been burned up in a great fire, it would rightly be regarded as a catastrophe, and the event would be recorded as one of the world's great disasters; but in what respect does this great tobacco fire which in two years burned up two billion dollars' worth of hard earned dollars differ from an ordinary big fire? Only in the fact that no other fire ever consumed so much property in so short a space of time, and in the fact that, in addition to the property loss, there was enormous loss of human life, to say nothing of the moral loss.

The five pounds' annual per capita dose of tobacco used by the people of the United States contains a poison dose of three grains of nicotine daily for every man, woman and child in the country, enough to kill several snakes. Some day the American efficiency instinct will stop this prodigious waste of property and life.

The Effects of Caffein

Q. **If coffee is injurious, why is it served to soldiers?**

A. We are glad to learn through the *Medical Times* that the government has become concerned about the sale of caffein drinks to the soldiers, which are admitted to have done very great harm to them, lowering morale and injuring the health of the victims. They are conceded to have encouraged crime and immorality.

"But is there not an inconsistency involved in this crusade against caffein drinks, so long as the men are provided with coffee? Why should young and vigorous men in the service be habituated to a powerful stimulant which they do not need, and which is known to be pernicious, while at the same time caffein drinks are prohibited outside the camps?

"It is not at all unlikely that caffein intoxication played a part in the recent riot at one of the camps, in the course of which two negroes and one white man were killed.

"Caffeinized neurotics are surly and quarrelsome. Thus the instability induced by caffein may have much the same results among bodies of men quartered together as are familiar in the case of alcohol.

"The individual who in civil life is merely a grouch and a nuisance because of his peculiar susceptibility to the toxic effects of caffein becomes in the military sphere a real menace."

Coffee and Fatigue

Q. **Is it true that coffee cures fatigue?**

A. It is often claimed that caffein, either in the form of coffee or some of the so-called "cola" soda fountain drinks cures fatigue. This of course is not true for nothing but rest can really cure fatigue. Experiments show that coffee has in fact the very opposite effect, — increasing fatigue.

The action of caffein is double. At first it diminishes the sense of fatigue, and causes a transitory stimulation; this is followed by pronounced reaction characterized by marked increase of fatigue.

Coffee Poisons

Q. **What is the element in coffee which is considered injurious to health?**

A. Caffein, which is a narcotic poison, and tannic acid, which interferes with the action of the gastric juice.

Roasted coffee contains pyramidine, a smoke poison produced by the roasting process.

Besides the above mentioned poisons, the coffee berry contains other poisons which produce highly injurious effects, such as arteriosclerosis or hardening of the arteries with high blood pressure, Bright's disease and apoplexy.

Caffein a Poison

Q. **What are the dangers that result from the use of caffein?**

A. Caffein is a poison. It is shown, not only by the ordinary effects produced by it, but by the fact that a slight overdose may produce fatal effects.

Caffeine is eliminated by the kidneys, and can be found in the urine from ten to fifteen days after discontinuing its use.

Under its influence one apparently is able to get through more work with less fatigue than he can without caffein. The effects, however, are merely apparent; all the caffein has done is to cover up the effect of the poisons which accompany fatigue.

The effects of caffein on the nerves is especially serious, tea in time producing wakefulness, nervousness, excitability, and unsteadiness and twitching of the muscles. Also, the digestive disorders, due to its tannic acid, are much more pro-

nounced when tea is freely used than are its stimulating effects. Flatulence, gastric distress, constipation, often irregularity of bowel action, and sleeplessness are the predominant symptoms resulting from tea-drinking.

Caffein as Medicine

Q. **Since caffein is used by the medical profession as a remedial agent in certain ailments, what proportion may be taken, and how often, without injury?**

A. Caffein is sometimes useful as a medicine, but no medicine is wholesome food. If used habitually it loses its effects so that it can no longer be used as a medicine. Caffein is prescribed by physicians to raise the blood pressure in cases of shock. It is one of the most reliable drugs known for raising the blood pressure. Two grains of caffein is the usual medicinal dose. An ordinary cup of cheap coffee contains two grains of caffein to the cup; "good" coffee contains four grains or two medicinal doses.

Tea and Arctic Travel

Q. **If tea, coffee, and tobacco are so very injurious why are they so much used by Arctic travelers?**

A. The earliest Arctic explorers relied upon alcohol to reënforce their energies, but experience showed their error. At the present time, no Arctic explorer makes use of alcohol in any form. Its use is absolutely prohibited,

One of the most experienced Arctic explorers, Nansen, discovered that tea, coffee and tobacco are unwholesome.

In his two most interesting books, "Across Greenland" and "Esquimo Life," Nansen takes a strong stand against tea and coffee as well as alcohol and tobacco.

When crossing Greenland, an exploit which made a supreme demand upon physical endurance, an observation concerning the effects of tea and coffee was made which is highly instructive. Nansen states that,

"After having tried the coffee extract two or three times in the afternoon and evening, and found that, though it cheered them up for a time, they got little or no sleep at night, they first restricted themselves to a morning cup, and then tabooed it altogether."

In regard to tobacco, Nansen says:

"Though tobacco is less destructive than alcohol, still, whether it is smoked or chewed, it has an extremely harmful effect upon men who are engaged in severe physical exertion.

"My experience leads me to take a decided stand against the use of stimulants and narcotics of all kinds, from tea and coffee to tobacco and alcoholic drinks. It must be a sound principle that one should live in as natural and simple a way as possible, and especially when the life is a life of severe exertion in an extremely cold climate. The idea that one gains by stimulating body and mind by artificial means, betrays, in my opinion, not only ignorance of the simplest physiological laws, but also a want of experience."

As to spirits, he says, "There is no sufficient pretext for using them, and the best course is to banish alcoholic drinks from the list of necessaries."

The explorer gave it as his opinion that the strict prohibition of the use of brandy in Greenland is absolutely necessary to prevent extermination of the natives, and adds: "Not only should the sale of brandy be prohibited, but also of coffee, tobacco, and other noxious products. It took us a long time to make them acquire the taste for them. On the west coast we have been unhappily successful in begetting the taste for coffee."

Cocoa Poisonous to Cattle

Q. **Is the theobromin found in cocoa actually poisonous?**

A. Yes. A. V. Lund, of Copenhagen (*Experiment Station Record*) has shown by carefully conducted experiments that the theobromin contained in cocoa is a poison to cattle. The cocoa bean contains a large percentage of oil. This is separated, and the residue has been offered as a cattle feed. The Danish government instituted an investigation as to the wholesomeness of this product as a food for livestock. The cocoa cake was fed to cows for two years, and the results carefully noted. Experiments were also made with fowls, rabbits and mice. The conclusion reached was that *"owing to its poisonous character cocoa cake should not be used as a cattle food."*

It was proven that the poisonous properties of cocoa cake are due to the theobromin which it contains. The investigator "noted that cocoa cake contains an amount of theobromin equal chemically and pharmacologically to the caffein content in tea and coffee."

Caffein and theobromin are practically identical in their effects upon the body, and are closely allied in their chemical composition.

It should not be difficult in the light of these experiments, for any intelligent person to reach the conclusion that tea and coffee as well as cocoa cake are poisonous substances, and cannot be more safely used by human beings than by cattle, fowls, rabbits, and mice.

Coca Cola

Q. **Is Coca Cola a wholesome drink?**

A. In the opinion of the writer, No. The *Journal of the American Medical Association*, in reply to a correspondent, says: "An analysis of Coca-Cola made by the Federal chemist is published in a government bulletin known as Notice of Judgment No. 1455. This analysis declares the stuff to contain from 0.92 to 1.30 grains of caffein to the fluid ounce. Various analyses have also been published in the advertising matter of the Coca-Cola Company. These all admit the presence of caffein in various amounts. It would seem that in the interests of the public health, the indiscriminate sale to children and adults of an alkaloid like caffein in the enticing form of a "soft drink" should be deprecated. It is difficult to avoid the conclusion that the unrestricted use of Coca-Cola must be deleterious. It is probably true that a carefully graded dose of Coca-Cola contains no more caffein than the average cup of coffee; and if Coca-Cola as a drink were subject to the same limitations, so far as availability is concerned, there might be but little danger in its

use. But people do not drink from five to fifteen or twenty cups of coffee daily. That they do, in some cases, drink an amount of Coca-Cola equivalent in caffein content to that amount of coffee daily can, we believe, be substantiated. In this *Journal* (June 6, 1914, p. 1828), is published a communication from a Colorado physician describing a case of asthenopia in a caffein addict who was taking from three to six glasses of Coca-Cola daily, in addition to two or three cups of strong coffee at mealtime."

Best Fabrics for the Skin

Q. **What is the best fabric to wear next to the skin?**

A. Cotton is unquestionably the best fabric for contact with the skin. Wool is too highly hygroscopic. It absorbs moisture and holds it. Cotton absorbs quickly and gives off quickly. Wool worn next to the skin, not only absorbs moisture, but with the moisture dissolves impurities. These are retained and give rise to irritation. The retained moisture also has the effect of relaxing the skin and increasing the liability to taking cold. Cotton absorbs moisture more readily and also gives it off more readily, passing it out upon the surface. Cotton is also less irritating. Woolen garments as many as may be necessary, should be worn over the thinner cotton garments next to the body.

Corsets

Q. **Why is corset wearing injurious?**

A. Corset wearing is potent in breaking down the blood-circulating functions of the diaphragm and thus increasing the congestion of the great sympathetic centers; this produces irritation, with reflex disturbances of the central nervous system, which shows itself in a great variety of mental and nervous symptoms—coldness of the hands and feet, tingling and numb sensations, blushing of the face and head, mental dullness, irritability, insomnia, "fidgets" and other neurasthenic miseries. The most serious structural and organic changes later appear in the liver and stomach, spleen, kidneys and blood-vessels.

Soft Collars

Q. **Do you think it is better from a health standpoint for a person to wear a soft collar rather than a starched collar?**

A. Most assuredly. A soft collar does not choke the neck. The large veins are in the sides of the neck and the least pressure on these veins will interfere with the circulation of the blood, cause congestion, headaches, confused thoughts, etc. Men and women both should wear soft loose collars.

High Heeled Shoes

Q. **Why is the wearing of high-heeled shoes injurious?**

A. High, narrow heels do not afford sufficient support for the foot, so that it is easily turned to one side, often resulting in serious sprains. The chief part of the weight being thrown forward

upon the fore part of the foot, it becomes weary in walking much sooner than it otherwise would. The narrow soles which usually accompany high and narrow heels are likewise productive of injury, from not allowing the whole flat of the foot to sustain the weight of the body, as it should. The high heels throw the weight forward upon the toes, which further embarrasses them in their cramped condition, and greatly increases the injury arising from narrow toes and soles.

Perhaps the greatest injury of all due to the wearing of high heeled shoes is the effect produced in causing the displacement of the pelvic organs in women. In consequence of the raising of the heels, the hips are naturally carried forward in the attempt to maintain the equilibrium of the body, and in consequence the normal obliquity of the pelvis is destroyed through straightening of the lumbar spine. After a time the lower vertebrae are displaced backward so that the normal anterior curve of the spine is destroyed and the organs of the pelvis all suffer downward displacement. Backache, menstrual pain, menorrhagia, and various other pelvic disorders arise from this cause.

Men's Clothing

Q. **We read much about the injurious effects of women's garments; what about men's clothing?**

A. The clothing worn by men has generally the following faults:

1. Too much clothing, which overheats the skin and weakens the entire body.

2. Non-porous, or too little porous to air,

suffocating the skin and preventing the escape of poisonous exhalations.

3. Dark color, excluding the chemical and luminous rays of the sun, which are essential to health.

4. Restriction of the movements of the shoulders and flattened chest from the wearing of suspenders.

All these evils may be easily remedied, as follows:

1. Wear less clothing. Except when exposed to the rigors of winter weather, little more clothing is needed in winter than in summer, at least for people whose occupation is indoors. The average indoor temperature is at least 70° F. The temperature required inside the clothing is about 86° F. To maintain this does not require a very great amount of clothing; certainly not more than half the ordinary amount usually worn by men in summer; and when one has become accustomed to light clothing in summer, much lighter clothing may be worn in winter without discomfort.

2. Light and porous fabrics are now available for men's garments, as well as women's, and in large variety. These porous fabrics afford the necessary protection with half the weight, because of the non-conducting property of the air which is entangled in the meshes of the cloth.

3. White is the ideal color for all seasons, winter as well as summer. White garments are warmer in winter and cooler in summer than colored garments, while all the time permitting the passage of the life-imparting light rays of the sun. White is a good reflector and a poor radi-

ator; this is the explanation of the paradox that in winter white prevents the loss of heat, in summer it affords protection from exterior heat.

Cotton vs. Wool

Q. **Is wool essential for clothing?**

A. Wool, as well as flesh foods, is becoming scarce. It has become evident to the world's economists that a densely populated world cannot afford the room needed for the pasturage of millions of cattle and sheep to provide food and clothing. Other resources must be developed which will not involve so great a sacrifice of foodstuffs needed by human beings.

Fortunately wool is no more essential to human comfort and well-being than are beef, mutton or leather. It may be dispensed with at no great loss, possibly with some gain. Here is the opinion of one expert on the subject, Mr. G. C. Burroughs, who writes upon the subject in the *Clothing Designer and Manufacturer:*

"Cotton and wool differ chiefly, and of course materially, in the fact that one is a vegetable, the other an animal, fiber. Cotton does not possess the heat-retaining property of wool; it is practically non-elastic—that is, it cannot be stretched or shrunk by the application of heat and moisture, the property which gives wool one of its most valuable specific virtues. It is highly inflammable, though it can be rendered practically non-inflammable by chemical treatment; while wool simply smolders or burns to a cinder without a noticeable flame, the principal evidence of ignition being an unpleasant odor not unlike burning bone—a simple means, by the

way, to tell whether the cloth is composed of cotton or wool. Cotton also has poorer wear-resisting qualities, it is less durable and far more easily torn than wool.

"Cotton, either alone or used in combination with wool, offers not only ample sources of supply, but also possesses properties of its own which to a large extent compensate for those it lacks in comparison with wool, and which make it possible under proper scientific treatment for it to be used successfully as a satisfactory substitute."

There are other advantages of cotton over wool well worth considering. The fact that cotton is less hygroscopic, renders it more hygienic as a garment, especially under conditions in which the activity of the skin is likely to be increased. Wool produces a mechanical irritation of the skin which increases perspiration. It also retains moisture through its great hygroscopic properties, and hence dries very slowly, remaining damp a long time after a cotton fabric would have become dry under the same conditions.

Also, it may be noted there are many persons whose skins are so sensitive that they cannot bear the contact of woolen fabrics. To such persons, cotton or silk is a necessity. It is doubtful whether this irritation is beneficial to any one. For many years the writer himself discarded wool, in faver of cotton or silk, as a next-to-skin fabric, and cotton is better than silk.

Even silk, another animal product, is not at all indispensable. Science has provided vegetable

substitutes which possess so many of the properities of the silkworm product as to be scarcely distinguishable from it.

It is certainly most interesting to notice how many lines of recent scientific progress converge upon the common object,—the elimination of animal products from the category of things essential to human existence or well-being.

Proportions of the Ideal Man

Q. **What are the proportions of the ideal normal man?**

	Inches
A. Height	68.
Sitting Height	36.
Length of Arms	68.
Circumference of Chest	34.
Circumference of Waist (46.4 per cent)	31.5
Height (length) of Sternum (9.5 per cent)	6.5
Height of Abdomen	14.9
Sternum to Umbilicus (12 per cent)	8.1
Umbilicus to Pubes (10 per cent)	6.5
Bi-iliac Diameter (16.6 per cent)	11.3

Proportions of the Ideal Woman

Q. **What are the proportions of the ideal normal woman?**

	Inches
A. Height	64.
Sitting Height	33.2
Length of Arms	64.
Circumference of Chest	32.
Circumference of Waist (47.6 per cent)	30.46
Height-length of Sternum (9.5 per cent)	6.08
Height of Abdomen	15.48
Sternum to Umbilicus (13.6 per cent)	8.7
Umbilicus to Pubes (10.6 per cent)	6.78
Bi-iliac Diameter (16 per cent)	10.24

A Well-Developed Woman

Q. **Should a normal woman have a small waist?**

A. No. Many years ago, while on a short vacation trip in Oriental countries, the writer had an opportunity to make some anthropometric studies of Oriental women, the result of which strongly confirms the claims that the proportionate development of Eastern women has not changed for many centuries. Most of the observations were made in Cairo, a few in Constantinople. The following table gives the proportions of ten Oriental women of whom five were Egyptians, three Nubian, one Soudanese and one Armenian:

	Age	Height	Waist	Chest	Hips	Per cent of H. to W.
EGYPTIAN GIRLS						
Fadela	20	64.4	34.4	36.8	44.8	53.4
Ariesta	25	62.8	28.8	34.0	35.2	46.0
Sejada	20	65.2	31.2	34.8	38.4	48.0
Senoba	19	61.6	28.8	32.8	37.6	47.0
Hannam	21	64.8	32.8	31.6	34.4	56.0
NUBIAN GIRLS						
Zena	19	61.6	30.0	34.0	36.8	48.7
Latifa	20	60.4	26.4	30.8	36.4	45.6
Aruna	19	62.4	29.6	33.6	35.6	47.4
SOUDANESE						
Amise	30	62.0	30.0	33.6	39.6	48.3
ARMENIAN WOMAN (Constantinople)						
A field worker	26	63.4	30.8			48.6
Average		62.86	30.28	33.55+	37.64	48.2%

With the exception of the Armenian woman, who was a peasant, all of the women referred to in the above table were reared under natural conditions, none having ever worn tight clothing or any clothing more hampering to the movements of the body than a light cotton gown about the equivalent of an ordinary night dress but shorter.

The measurements made of this group of natural women shows an average height of 62.9

inches and waist measure of 30.3, a waist proportion slightly larger than that of the Venus de Milo and other Grecian models.

The height of the average woman is sixty-four inches. The average waist measurement of several hundred young women, eighteen to twenty-two years of age, as determined by Dr. Annie Wood, was found to be twenty-four inches, giving a waist proportion of thirty-seven and five-tenths per cent of the height. This makes the waist of the American woman one-fifth less in size than that of the ideal woman of ancient Greece. It is very interesting to find that the modern woman who has the same opportunity for natural physical development that the ancient Grecian woman had, has an equally well developed waist. There seems no room for doubt that the small waist of the American woman and the diminished vital power which permits her so easily to drop into a state of chronic invalidism is the result of her restrictive mode of dress and sedentary habits of life.

The Normal Waist Proportion

Q. **What should be the size of the waist as compared to a woman's height?**

A. A woman's waist measurements, according to the proportions of the famous Venus de Milo, should be 47.6 per cent of the height. A woman requires a larger waist for the reason that in women the liver, stomach, spleen, kidneys, pancreas and colon—all the organs which lie in the waist zone—are relatively larger than in men; that is, they are larger in proportion to the body weight. This is a necessary conse-

quence of the function of motherhood. The liver, stomach and other vital organs of women are prepared to do work for two; hence their larger proportionate development. The idea that a woman's waist must be small is an absurd and most pernicious error which has been created and propagated by fashion-mongers. This idea should be most earnestly combated. A small waist is an evidence of weakness. A very small waist necessarily implies prolapsed stomach and bowels, often a dislocated liver and a floating kidney. These displacements are a serious cause of disease. Their presence is often shown by protrusion of the lower abdomen and sinking in at the waist. (See page 477.)

The Energy Capacity of the Body

Q. **What is the total energy output of the human body each twenty-four hours?**

A. According to the most recent scientific estimate, the energy output of the human body is equivalent to one-sixth of a horse power.

The energy value of a horsepower is 550 foot pounds per second, 33,000 per minute, nearly 2,000,000 foot pounds per hour, or 48,000,000 in twenty-four hours. The actual average amount of work which a horse generally does when doing ordinary work is 21,000 foot pounds per minute or about two-thirds that of the standard horsepower. A mule does 10,000 foot pounds, an ox, 12,000, a man in rowing 4,000. A man may during violent exercise such as running up a stair case, do work equal to one horsepower.

Metabolism studies show that the expenditure of energy is distinctly increased by such slight

exercises as are involved in the sitting position.

A person who has been lying in bed, on sitting up will expend twenty per cent more energy than when lying down and hence will require a distinct increase in food in proportion to the length of time spent in the sitting position. That is, when a person who has been constantly lying in bed becomes, through convalescence, able to sit up one-fourth of the time, it will be necessary to increase the food intake about one-twentieth.

Required Amount of Energy Intake

Q. **What is the amount of energy required under different conditions of rest and work?**

A. According to the latest authorities (von Noorden) a man weighing 154 pounds expends energy at the following rates under the conditions named:

With hard work	3,500	calories and over
With medium work	3,100	" " "
With light skilled work	2,600	" " "
With rest in room	2,230	" " "
The minimal exchange	1,625	" " "
The minimal exchange after food intake	1,800	" " "

"The most muscular and best-trained individuals do not show any greater formation of heat in the resting condition and during sleep than individuals possessing a feeble muscular system."

The Energy Required for Assimilation

Q. **Is it known how much energy is required for the digestion and assimilation of food, and if so, is there a difference between different kinds of foodstuffs?**

A. The subject has been studied by Dr. F. G. Benedict and Dr. Y. M. Carpenter, at the Carnegie Laboratory, and in using very exact methods, they have reached the following interesting conclusions.

"1. The work of mastication, such as would be involved in chewing gum or a rubber stopper continuously, may temporarily require an increment in heat production of approximately 17 per cent.

"2. Ingestion of water with a temperature of either 22° C. produces no significant increment of the basal metabolism, if not over 500 grams of water are taken. With larger amounts of cold water there may be an increase which, in certain instances, has been found to amount to 16 per cent above the basal value.

"3. Coffee, owing probably to its caffein content, acts as a stimulus to the metabolism. Approximately 325 grams of coffee at a temperature of about 60° C. will produce an increment in the metabolism of 8 to 9 per cent.

"4. Beef tea, taken either hot or cold, slightly increases the metabolism.

"5. With carbohydrates the basal metabolism may be increased to an average maximum of approximately 25 per cent by the ingestion of 100 grams of any one of several sugars, although levulose and sucrose appear to exert a somewhat more powerful influence than the other sugars. This increment occurs inside of two hours, and the metabolism has a tendency to return to the base-line somewhat rapidly thereafter.

"6. Ingestion of a diet containing a pre-

ponderance of fat produces a positive increment in metabolism, although this increment is considerably less than that observed with an equivalent amount of energy in either carbohydrates or protein.

"7. Ingestion of protein in almost any quantity invariably produces an increase over the basal heat-production, which may be 25 per cent for several hours, and for short periods may rise to 45 per cent. No definite mathematical relationship between the amount of protein ingested and the increment in the total metabolism could be established in these experiments. No clearly defined difference between the animal and vegetable proteins was found in their influence upon the metabolism.

"8. Experiments with mixed diets, especially those with excessive amounts of food, showed that by the ingestion of a large meal it was possible to stimulate metabolism to 40 per cent above the basal value for a number of hours, and to 20 per cent for at least eight hours."

Energy Expended in Mental Work

Q. **Does hard mental work require the expenditure of a large amount of energy?**

A. It was formerly supposed that mental work as well as muscular work involved the expenditure of a large amount of energy and hence made necessary the taking of considerable quantities of food. It is now known, however, that this is an error. According to Speck, mental work exercises no direct influence on metabolism. Even intense mental activity is not accompanied by any considerable consumption of energy.

Also the amount of energy consumed by the viscera in carrying on their work is surprisingly small. H. Dreser estimates that the work done by the kidneys in eliminating one and a half liters of urine requires the expenditure of only ¾ of one calory. There is no artificial machine which operates with so little friction or so high a degree of efficiency as the animal body.

Static Muscular Work

Q. **Is actual muscular work done when holding a weight without moving it?**

A. Muscular contraction without work is properly called contracture or static muscular action.

When work is done, as the lifting of a weight or any movement of the limb, the action is termed dynamic. According to Beclard, static muscular contraction involves a greater expenditure of energy than dynamic contraction.

Vital Capacity

Q. **What is meant by vital capacity?**

A. By this is meant the number of cubic inches of air which can be exhaled after a deep inspiration. This has been found to have a direct relation to the height of an individual. A man who is five feet and one inch in height has a vital capacity of 175 inches. Each individual inch in height adds eight inches in vital capacity. Thus, a person measuring five feet eight inches high should have a vital capacity of 230 cubic inches. The lung capacity is measured by means of a spirometer. The strength of the breathing muscles may be measured also.

The above statements are based upon the standards adopted by Hutchison. It appears to the writer that the sitting height ("stem length") should be used as the basis for calculation rather than the standing height.

Lung Capacity

Q. **What is the normal lung capacity?**

A. The following table shows the lung capacity in cubic inches and the strength of the chest measured in pounds lifting power:

Men		Women	
Height in Inches	Spirometer (cu. in.)	Height in Inches	Spirometer (cu. in.)
72	287	67	204
71	273	66	196
70	257	65	188
69	254	64	180
68	249	63	172
67	245	62	164
66	231	61	156
65	229	60	148
64	206	59	140
		58	132

Chest Strength

	Lbs.		Lbs.
72	360	67	166
71	345	66	162
70	330	65	158
69	315	64	155
68	300	63	150
67	290	62	145
66	270	61	140
65	255	60	135
64	233	59	130
		58	125

Body Weight

Q. **What is the normal weight of the human body at different ages in men and women?**

A. The normal weight of the body varies, of course, with the height. The accompanying table shows the normal weights for men and women of different heights.

MEN			WOMEN		
Height in In.	Weight in Pounds	Surface in Square Ft.	Height in In.	Weight in Pounds	Surface in Square Ft.
61	131	15.92	59	119	14.82
62	133	16.06	60	122	15.03
63	136	16.27	61	124	15.29
64	140	16.55	62	127	15.50
65	143	16.76	63	131	15.92
66	147	17.06	64	134	16.13
67	152	17.40	65	139	16.48
68	157	17.76	66	143	16.76
69	162	18.12	67	147	17.06
70	167	18.48	68	151	17.34
71	173	18.91	69	155	17.64
72	179	19.34	70	159	17.92
73	785	19.89			
74	192	20.33			
75	200	20.88			

Walking

Q. **What is the best system of daily exercise for one whose health is completely broken down.**

A. Walking is one of the best of all exercises. Experiments made by an eminent English physician show that the average man must walk nine miles daily on a level surface, to obtain the amount of exercise necessary to maintain health.

The amount of exercise must, of course, be regulated to suit the strength. For a feeble per-

son half a mile or a mile may be a sufficient distance at the beginning, but the distance should be gradually increased as the strength increases. In mountain climbing, each foot of ascent counts as the equivalent of thirteen feet on a horizontal level; walking a mile is equivalent to lifting the body vertically four hundred feet. Hill climbing is an excellent means of graduated exercises, steeper hills being climbed as the strength increases.

Stair Climbing

Q. **Is stair climbing healthful exercise?**

A. For persons who are suffering from disease of the heart or some other disorder which forbids heavy exercise, stair climbing is a very excellent means of obtaining a large amount of exercise in a short time. Suppose, for example, the height of the staircase to be twelve feet and the run sixteen feet. The labor of going up and down the stairs will be equivalent to walking 200 feet and twenty-six such trips will be the equivalent of walking one mile. Walk slowly.

Exercise on All Fours

Q. **Is there any value in taking exercise on all fours?**

A. An eminent French physician recommends exercising on all fours as a means of aiding the stomach to evacuate the products of digestion.

The doctor proved by x-ray examinations of several subjects that the stomach empties itself much more rapidly in the all-fours position than in the upright position. The suggestion is made that man has not made use of the upright position for a sufficient length of time to enable

his internal organs to become adapted to this position, which puts them at a disadvantage as compared with the horizontal position of our relatives, the higher apes.

Breathing Exercises

Q. What are the best breathing exercises?

A. Breathing exercises are highly valuable for two purposes:

1. To expand and develop the lungs.
2. To aid the circulation of blood, especially to assist the movement of blood through the liver and other abdominal organs. The movements of the chest walls and diaphragm during inspiration create a partial vacuum in the chest which draws air into the lungs and the blood toward the heart.

All sorts of bodily movements are breathing exercises because they increase respiratory activity. The lungs act best when a demand for air has been created by exercise. Walking at a rate a little faster than the usual gait is an excellent means of stimulating free lung movement. Arm raising and other arm movements, especially the movements of swimming, expand the chest and improve breathing.

Deep breathing practised with the body supported on an inclined plane, the head low, is especially useful. After placing the body on an inclined table, which may consist of a folding table or an improvised table consisting of an ironing board with one end resting on the floor and the other resting on a chair, bed, sofa, window-sill or some other support, take the following exercises:

Exercise 1

1. Breathe deeply while percussing and beating the abdomen vigorously.

Exercise 2

2. Deep breathing, hands grasping the sides of the table, pull with the hands while breathing out. This fixes the chest in a high position and so secures full action of the abdominal muscles.

Exercise 3

3. Deep breathing, hands clasped over lower abdomen, pressing firmly during both inspiration and expiration. This strengthens the breathing muscles.

Exercise 4

While breathing deep, finger tips touching, make pressure upon the abdomen with the little finger side of the hands, starting just above the pubis and working slowly upward an inch or two at each breath. The pressure should be continuous during expiration and inspiration. Repeat six or eight times.

Swimming

Q. **Is swimming a good exercise?**

A. Swimming is unquestionably one of the best of all forms of exercise. It is especially valuable as a means of developing the lungs. The effect upon respiration is truly remarkable. During rest the amount of air which passes through the lungs is one to two gallons per minute. During vigorous exercise the quantity may be increased to four or five times this amount, but in swimming the respired air

may reach the enormous quantity of twelve or thirteen gallons per minute. The consumption of oxygen in the body is increased in even greater proportion. Hence, the high value of swimming as a means of promoting those bodily changes which result in reconstruction and rejuvenation. This is the explanation of the great benefit derived from sea bathing, the value of which has been appreciated from the most ancient times. It should be remembered, however, that there is no essential virtue in either the saltness of the water of the sea or the peculiar odor of the sea air. The real value of sea bathing is to be found in the exercise and the coolness of the water. These fine advantages may be found in a simple cool bath in a bathtub in every home. The rowing bath described elsewhere is of great service in increasing the value of the bath by stimulating the action of the lungs.

A Full Chest

Q. **How may one develop a full chest?**

A. By cultivating the habit of sitting straight, holding the chest well forward, by swimming and other exercises in which the movements are executed by the arms.

Normal Breathing

Q. **What is the normal way to breathe?**

In normal breathing the whole chest expands simultaneously, the chief movement being in the lower part of the chest and abdomen. When the chief movement of the chest in breathing is at its upper part, the diaphragm does not descend properly, and the necessary influence of breathing upon the blood and circulation of the ab-

dominal organs is lost. In normal breathing the diaphragm, in descending, compresses the liver, stomach, colon and other internal organs and aids each of them in the performance of its function the rhythmical movement communicated to them.

Round Shoulders

Q. **What is the best method of correcting round shoulders?**

A. A correct position in sitting and exercises for developing the arm and shoulder muscles are necessary. In sitting, standing and walking the chest should be held high, the abdominal muscles being well drawn in, the hips held back, while the chest is held forward. Swimming is, perhaps, the best of all exercises for the correction of this condition. Lying upon the back and raising the head is also a good exercise.

The daily use of corrective exercises, such as lying upon the face and raising the head backward, bending backward, and rowing are essential in all cases.

The most important measure of all is a correct sitting posture. For this a proper chair is needed, one which will support the center of the back. In the absence of a properly constructed chair, a cushion may be placed at the small of the back. The chest must be held up and the chin in.

Poison in the Breath

Q. **Is there a poison in the breath in addition to carbon-dioxide?**

A. Yes. Thirty years ago (1889), the writer saw in the laboratory of the late Dr. Brown-Sequard in the process of being carried out, a most interesting experiment which seemed to demonstrate beyond all question that the expired breath contains poisons which are deadly to animals when sufficiently concentrated.

The accuracy of these experiments has since been disputed, especially since Professor Hill, of England, a few years ago published the results of some experiments which seemed to indicate that the breath contained no toxic substance.

Professor Hill in his experiments selected each one of the several elements of the expired breath, that is, the carbonic acid gas, the moisture and the heat, and has shown that each one of these individually considered, is comparatively innocuous, at least does not produce a deadly effect.

The method pursued by Dr. Hill if applied to a wagon, would demonstrate that there is no such thing as a wagon. A wheel is not a wagon; an axle is not a wagon; the wagon box is not a wagon; hence there is no such thing as a wagon. All the various parts of the wagon put together constitute the wagon. Common experience proves the expired breath to be poisonous. The fact that the cooling of the expired breath seems to purge it of its poisonous properties, the writer has considered satisfactory evidence that the breath poison is probably associated with the moisture of the breath.

Pure Oxygen

Q. **Is there any advantage to be derived from breathing pure oxygen?**

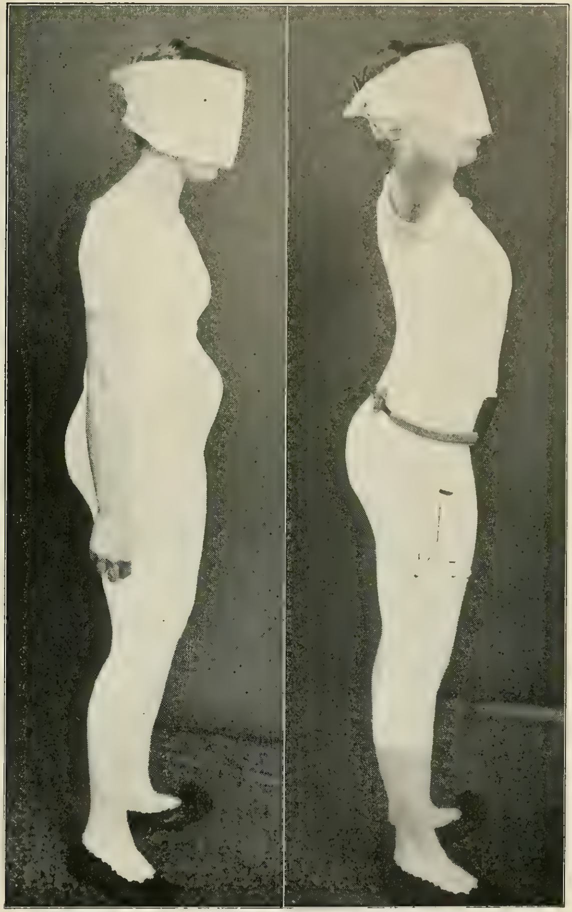
A. When breathing atmospheric air, the arterial blood takes up only 90% of the oxygen which it may absorb when shaken with atmospheric air. When pure oxygen is breathed the blood is able to take up an additional 10% of the oxygen, but this is of no value to the healthy body. Under exceptional circumstances, however, the body is able to make use of the additional 10% which is absorbed when breathing pure oxygen. This is true, for example, in cases of asphyxiation when through weakness of the heart the breathing is embarrassed and the lips blue in consequence. In cases of dyspnea, pure oxygen gives almost instant relief.

Oxygen is a valuable remedy in cases of pneumonia in which a large portion of the lungs is involved, and in cases of heart disease in which the blood is insufficiently aerated.

Correct Standing Position

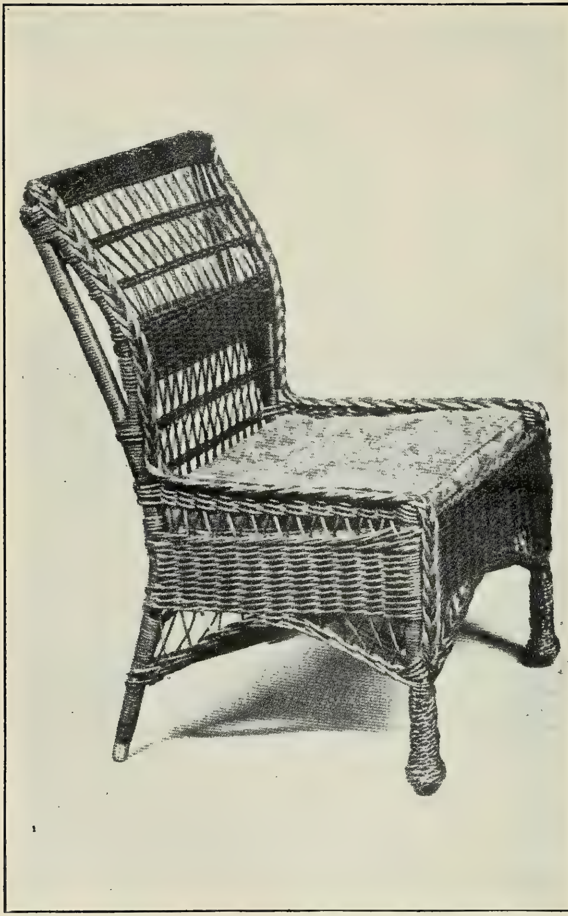
Q. **How can one know when his standing position is correct?**

A. In a correct standing position, a plumb line dropped from the ear should fall just back of the first joint of the great toe. Many persons stand with the hips placed so far forward that if a plumb line were dropped from the ear it would fall opposite the heel. In this position the chest is flattened, the abdominal muscles are relaxed, and the lower abdomen protrudes. In a correct position, the chest is carried well forward, the hips are held well back. The back is



Relaxed protuberant abdomen, a result of bad sitting position and relaxed muscles.

The same person standing, poise corrected and abdomen held up by a spring supporter.



The Comfort Chair

quite strongly concave, and the anterior wall of the trunk is convex. The abdominal muscles are well drawn in. This position may be secured without the aid of an instructor by the following method:

Standing with the back against a wall or a door, brace the heels, hips, shoulders, back of head and the little finger side of each hand firmly against the wall. Now push the shoulders forward away from the wall, by bending the head backward until the eyes look straight up to the ceiling, keeping the heels, hips and hands firmly pressed against the wall so as to fix the muscles of the trunk; then bring the head forward away from the wall, drawing down the chin without allowing the shoulders to move backward.

Chairs

Q. **How should a chair be constructed to be healthful?**

A. Many chairs are made with hollow backs which are in the highest degree objectionable. Most chairs are constructed with reference to artistic effects rather than to meet physiologic needs. The defect of the ordinary chair may be partially remedied by means of a cushion placed in such a position that it will support the hollow of the back.

Sitting

Q. **Is sitting a natural attitude?**

A. Civilized man, when he desires to rest, sits instead of lying down, and when sitting he relaxes his trunk muscles, thus permitting the pull of gravitation to act upon his viscera. Doctor Arbuthnot Lane of London, who has given much

attention to the subject of visceral displacement, calls attention to the fact that the natural sitting position is the squatting attitude, in which the relaxed abdominal muscles are supported by the thighs.

As we cannot return to the savage mode of squatting or the Oriental method of reclining, it is evident we must reform our chairs, and this process may be easily accomplished. It is only necessary to give the seat and the back of the chair a stronger inclination backward and to give to the back of the chair an anterior convexity, especially in its lower part, instead of the hollow which is usually seen, or the straight back which is nearly as bad. The defect may be remedied by means of a small cushion placed at the back.

The Effects of Bad Posture

Q. **In what way does bad posture affect the health?**

A. Hill and Barnard, eminent English physiologists, made a somewhat cruel experiment from which a most important lesson may be drawn.

A tame rabbit was held in a vertical head-up position. In a comparatively short time, the rabbit was found to be dead from anemia of the brain. Most of the blood in the rabbit's body had accumulated in its abdomen. The experiment was repeated with the same result. The rabbit always died in a short time. The rabbit was not injured in any way. It was only held upright. Yet it died.

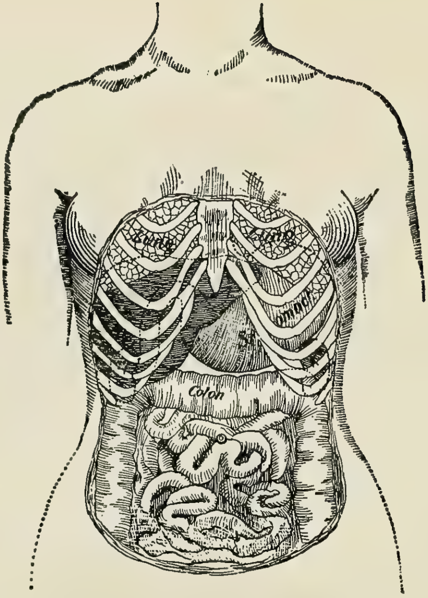
When the same experiment was tried with a wild rabbit, the result was different. The animal

Flat Foot

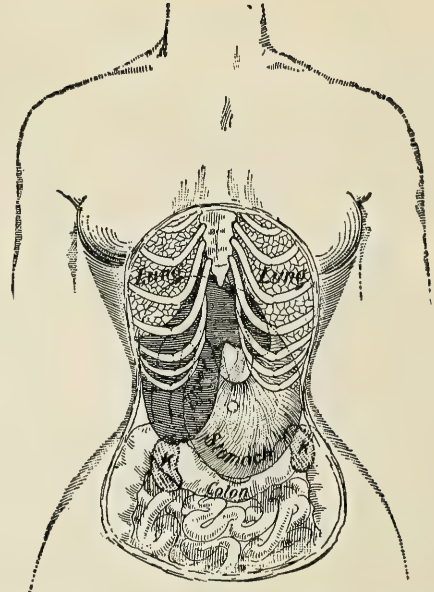
a *b* *c*

Foot Prints of Normal and Deformed Feet

(See page 623)



The Intestinal Organs in Normal Position



The Internal Organs Displaced by Waist Constriction

did not die. Another experiment showed the reason.

A tame rabbit with a bandage applied to its abdomen was held in a vertical position. The animal survived, as did the wild animal. Evidently the cause of death was that the abdominal muscles of the tame rabbit because of its inactive life were not strong enough to afford the proper support to the large vessels of the abdomen, so that when the animal was held erect, the blood which normally belongs in the head, brain, and other upper parts of the body, runs down into the abdomen, filling the distended veins and so accumulating at the expense of the brain and other vital parts.

The wild rabbit has strong abdominal muscles because of its active life, and so is able to bear the abnormal posture without injury, as the tame rabbit is able to do when its abdomen is supported by a bandage.

Thousands of persons, professional men, teachers, college professors, and millions of women in civilized lands, because of their sedentary lives and feeble muscular development, suffer in a similar manner, though not to the same degree as the vertically held tame rabbit.

A tame or civilized man or woman is damaged in just the same way as is the tame animal. Weak muscles, low vital resistance, feebleness, inefficiency, are the natural result.

Neurasthenia, constipation, pelvic disease in women, disease of the prostate in men, hemorrhoids, and many other miseries and maladies, result from a bad sitting posture. The posture should be corrected by the use of a proper chair,

combined with suitable exercises and proper dress. Tight bands and high heels must be discarded. (See accompanying cuts.)

Spinal Curvature and Visceral Disease

Q. **What harm results from spinal curvature?**

A. Careful investigations made in various European cities have developed the startling fact that in most schools a large proportion of the students, even at an early age, have curvature of the spine as the result of the wrong attitudes assumed in sitting while at their studies. Curvature of the spine is a matter of importance because of the direct relation between external deformities of this sort and internal displacements of the viscera, such as prolapsed stomach, movable kidney and prolapsed liver and bowels. It is strange that, among civilized people, so little attention is given to the development of a good physique and erect carriage of the body. Among many half-civilized tribes, as the Arabs, for example, great attention is given to this matter. Children are taught from earliest infancy to walk, sit, and stand erect, and as the result, spinal curvature is practically unknown among the children of the desert.

Walking Posture

Q. **What is the correct walking posture?**

A. It should be borne in mind that in walking for health purposes the aim is not to reach a goal as soon as possible, but to get the greatest possible amount of good from the exercise. The greatest benefit derived from walk-

ing is probably due to the acceleration of respiration and the direct and indirect benefits which result from this increased respiratory action to which attention has already been called. For this purpose it is necessary that the breathing apparatus be put into such a position as to secure the highest degree of efficiency. This is accomplished by carrying the chest high and well forward, drawing in the chin. When the chest is raised in this manner, the effect is to render tense the muscles which connect the sternum and lower ribs with the bones of the pelvis. When the diaphragm descends with inspiration, the liver, stomach and other abdominal organs are compressed against the tense abdominal wall, and are thus emptied of the blood which accumulates during the period of exhalation in which the diaphragm relaxes and ascends in the chest. Thus with each complete breath the abdominal viscera are alternately compressed and relaxed, a sort of massage process which stimulates their activities by accelerating the movement of blood through them and securing the highest degree of efficiency possible.

When the body is poised in this manner, the chest well forward and the chin drawn in so that the weight of the body falls over the ball of the foot rather than over the heels, no attention to breathing will be required. It is better, in fact, to give no thought whatever to the breathing, but simply to walk, and to make the pace, unless the strength is too feeble to permit of so doing, about one-half faster than the ordinary walking gait. This will require attention and constant energizing of the muscles and

so will considerably increase the amount of work done and the general effect of the exercise.

The arms should be allowed to swing freely by the sides and thus to assist in walking. It is not possible, of course, to place the toes upon the ground before the heels as some writers have taught, but the toes should strike the ground so soon after the heels that the short interval intervening will not be noticeable.

The clatter made by some persons in walking is the result of placing the heel so long in advance of the toe that two distinct sounds with a considerable interval are observable which is sufficient evidence of a defective carriage of the body.

Training in Walking

Q. **How may a boy be trained in correct walking?**

A. The child should have daily gymnastic practice in correct walking. He should be shown how to raise the chest and carry the chest forward. The practice of carrying objects upon the head is a good one; but it would not be a good plan to put two pounds of shot in the boy's cap, as this would overload his head and neck and very likely increase the difficulty.

Walking on "all fours" is a most excellent means of expanding the chest and correcting "round shoulders." Babies should be encouraged to creep a good deal to ensure an erect carriage in walking.

The Proper Walking Gait

Q. **What should be the rate of walking for healthful exercise?**

A. In general, chronic invalids require a considerable amount of exercise, but should avoid violent exercise. Walking at the rate of 2½ to 3 miles an hour is about the proper gait. For feeble persons a slower rate is necessary.

Gymnastics for Business Men

Q. **What exercise is suitable for a business man?**

A. From the standpoint of general nutrition, the important factor in exercise is not the length of time devoted to it, but the amount of actual muscular work done. To accomplish a large amount of work in a short time, it is necessary to employ as large a number of muscles as possible, especially of the large muscles of the body, those of the trunk and legs. Of course, it is possible to cary this idea of condensing exercise to an extreme. I remember a college chum who used to go out on the back porch of the boarding-house every Sunday morning, and make a great jump. When asked the reason for this performance, he replied that it was his method of taking exercise. He took no other exercise whatever at any other time, or at least as little as possible, devoting himself to his studies most assiduously. He explained that by making one great jump once a week, and exerting himself to the utmost, he exhausted his energies to that degree that he required no further exercise. Of course, his theory was wrong, and he died years ago at a little more than fifty years.

Seneca, in his charming essay, "Brawn and Brains," tells of a better way. Here are some of his very wise suggestions:

"There are short and simple exercises which tire the body rapidly, and so save our time, and time is something of which we ought to keep a strict account. These exercises are jumping or broad jumping, or the kind I may call 'the priest's dance,' or, in slighting terms, 'the clothes cleaner's jump.' Select any one of these, and you will find it plain and easy."

Seneca evidently believed in jumping as a good exercise. However, the jumping which he referred to was not the violent exercise now commonly known by this term, but the modified jumping or hopping of certain dance steps, particularly well illustrated in folk dancing.

John Wesley, who lived to a very advanced age, and led an astonishingly active life, acquired the habit of systematic exercise when a youth, and continued great bodily activity all his life, riding much on horseback. When a student in London, in his younger days, he used to run three times around Charter House Square every morning.

Running is an excellent mode of exercise for boys and young men. The pace should be very moderate, not more than six or seven miles an hour.

William Cullen Bryant had a unique plan for taking exercises which served him well. On rising every morning, he first of all practiced the simple exercise of heel raising, which consists of raising the body from the ordinary standing position to tip-toe standing. This exercise was repeated five hundred times in rapid succession.

Legs Raising

A Vigorous Trunk Exercise

THE EXERCISE TABLE

Leg Flexing, Trunk Twisting

Leg Flexing, Trunk Twisting

THE EXERCISE TABLE

He next executed a movement which he called "dipping." In this exercise, the weight of the body is supported by the hands grasping the back of two chairs, with the feet drawn up, the body then being lowered so as to flex the arms, and afterwards coming to rest. This exercise was repeated forty times every morning.

Mr. Bryant was also a good walker. He usually walked several times daily from his residence to the Post building, and on reaching it, he did not take the elevator, but nearly always walked up the stairs to his office on the top floor.

Benjamin Franklin was much given to exercise. He was one of the most expert swimmers of his day. Franklin made the sage suggestion that "There is more exercise in one mile's riding on horseback than five in a coach; and more in one mile's walking than five on horseback"; to which I may add that there is more in walking one mile up and down stairs than in five on the level floor. The two latter exercises may be taken within doors when the weather discourages going abroad, or when one is pushed for time.

Modern studies have shown that in going upstairs one accomplishes more than ten times the amount of work required in walking the same distance on the floor. In descending the stairs, the amount of body work is double that of walking on a level surface.

Thomas Jefferson adopted running as a method of securing a sufficient amount of exercise in a short time. It was his daily custom when a student to make a rapid run of a mile and back, a certain stone marking the end of the course.

For the maintenance of good health, it is necessary to take enough muscular exercise daily to produce free perspiration and a sense of bodily fatigue.

Comparative Strength of Men and Women

Q. **What is the comparative strength of normal men and women?**

A. The accompanying table shows the strength of the principal groups of muscles in the average man and average woman together with the total strength, as determined by the dynamometer lbs.

	Men.	Women.	
Hand Flexors	249.	125.	.50
Hand Extensors	54.	29.	.53
Forearm Supinators	143.	57.	.39
Forearm Pronators	134.	57.	.42
Arm Flexors	120.	48.	.40
Arm Extensors	127.	53.	.41
Latissimus Dorsi	185.	99.	.55
Deltoid	140.	71.	.50
Pectoral	209.	102.	.48
Shoulder Retractors	160.	95.	.59
Foot Extensors	614.	364.	.59
Foot Flexors	145.	89.	.61
Leg Flexors	200.	116.	.58
Leg Extensors	237.	123.	.51
Thigh Flexors	303.	179.	.59
Thigh Extensors	330.	174.	.52
Thigh Abductors	206.	135.	.65
Thigh Adductors	227.	142.	.62
Trunk Anterior	139.	73.	.52
Trunk Posterior	380.	173.	.45
Trunk Lateral—R. and L.	287.	154.	.54
Neck Anterior	35.	19.	.54
Neck Posterior	75.	37.	.49
Neck Lateral—R. and L.	126.	60.	.47
Inspiration—Waist	172.	79.	.45
Inspiration—Chest	190.	85.	.44
Inspiration—Pneumatometer	.9	.4	.44
Expiration—Pneumatometer	2.6	1.4	.54

		Men.	Women.	
Arms				
	Right	770.	373.	.48
	Left	751.	363.	.48
Legs				
	Right	1131.	663.	.58
	Left	1131.	659.	.58
Trunk		1042.	516.	.49
Chest		365.	166.	.45

Totals

	Men	Women
Strength of Arms	1521	736
Strength of Legs	2262	1322
Strength of Trunk	1042	516
Strength of Chest	362	166
Strength of Entire Body	5197	2740

Body Temperature

Q. **How is the temperature of the body maintained?**

A. The body like all other living objects maintains its own standard of temperature. The heat generated by the body is about equal to that produced by a 16 C.P. carbon filament lamp or the amount which would be generated by the complete combustion of ten ounces of oil. The source of this heat is the oxidation or combustion of food which serves the body as fuel just as coal serves a locomotive. The normal temperature of the interior of the body is about 100°, of the mouth 98.2° F.

Heat is a by-product of all sorts of bodily activity. In muscle work, three-quarters of the energy expended appears as heat. Even when resting, heat production is still the result of muscular work in the form of muscle tension or tonus which is maintained by impulses sent to the muscles from automatic nerve centers at the rate of 18 to 20 a minute. This automatic

muscle work expends 30 to 50 per cent of the energy of the body when in a state of rest. Attention, worry, suspense or nervousness may greatly increase the "tonus" and may thus double the energy expenditure and heat production. Shivering is greatly increased tension caused to increase heat-production. Muscle cramp is greatly exaggerated tension.

How Body Heat Is Regulated

Q. **By what means is the heat production of the body regulated?**

A. The temperature of the interior of the body is constantly maintained at 100° F. notwithstanding the fact that constant loss is taking place by the radiation of heat from the body as well as by contact of the skin with the air and other bodies of lower temperature. This heat loss is constantly taking place. The rate of heat loss depends then chiefly upon the extent of the body surface. A constant loss of heat is taking place by radiation from the surface of the body and by contact of the body with the air, but the chief loss of heat occurs through the evaporation of the insensible perspiration.

The loss of heat is lessened by the clothing which maintains underneath at a temperature of about 86° F., the neutral air temperature. In an atmosphere of 86° no clothing would be needed for warmth.

When heat production is increased, as by exercise, the vessels of the skin dilate, the skin reddens, more blood is brought to the surface and perspiration is increased, and thus the body is more rapidly cooled, and a rise of temperature

prevented. When the surroundng air is above 86° the heat of the body tends to accumulate and so perspiration is increased to prevent over-heating.

When the body is exposed to cold, the vessels of the skin contract and so heat loss is checked, if the heat loss is so great as to lower the temperature of the blood a chill occurs with shivering, which is nature's method of warming the body up by setting the muscles to work.

Rubbing the skin prevents chill by stimulating the circulation.

Exercise is the most efficient means of stimulating heat production. All mechanical work done by the body is accompanied by the production of heat. In general, twice as much energy is expended in heat production as in the external work done. In violent exercise the production of heat is so rapid that the temperature of the body may rise as much as two or three degrees. Strong swimmers are able to remain in ice water for one hour or more.

When Is a Person Old?

Q. **At what age should one be considered old?**

A. "A man," said a famous French physiologist, "is as old as his arteries." This statement is literally true. Old age is the result of hardening and narrowing of the arteries, whereby the blood supply of the several organs of the body fails, the tissues shrivel, all the functions of the body lessen in efficiency, every tissue deteriorates, the body falls into decay, the flame

of life burns gradually lower and lower and finally flickers out.

Old age is natural death when it occurs after many years of life. The natural duration of human life is probably not less than 120 to 150 years. There are cases on record in which persons have lived a century and a half, and there are numerous instances of life extension to 120 years. There are living in the United States at the present time about 4,000 centenarians. It is probable that in the whole world there are living at least 20,000 people who are a hundred years old or more. The average length of life in civilized lands is only about fifty years, perhaps not more than one-third the normal length of the life for human beings. Comparatively few people die of old age. Hardening of the arteries and various diseases of the heart and blood-vessels which are characteristic of very advanced years are frequently observed in comparatively young persons.

It is true, "a man is as old as his arteries;" it is equally true that a man is as old as his liver, as old as his kidneys, as old as his heart. When any vital organ fails, the whole body collapses.

Metchnikoff on Old Age

Q. **Is it true, as Metchnikoff supposed, that the colon germ is the cause of old age?**

A. Professor Metchnikoff was probably right regarding old age as a malady, capable of control by measures akin to those by which disease is prevented and cured. Said Metchnikoff:

"It is common knowledge that the flesh of old animals, used as food, is tough An old fowl

A HAIR TURNING GRAY. CHROMOPHAGS TRANSPORTIHG THE PIGMENT GRANULES

Diseased White Blood Cells

cannot be compared with a tender and juicy chicken. Organs such as the liver and kidneys are much harder in the case of old animals. The horny flesh of old animals is often compared with boot leather. Although the comparison does not pretend to be scientific, it is far from being incorrect. Boot-leather is made from the hides of animals; that is to say, of very resistant material that is called "connective tisues," and which consists of a dense mass of fibers, mingled with the living elements or "connective tissue" cells. This tissue is very durable and so is employed for boots and shoes.

"The infiltration of any organ with connective tissue makes it tough and unpalatable. This hardening is called a *sclerosis* (of the liver, kidneys, etc.). In old age many organs exhibit this tendency to hardening or sclerotic degeneration. The fact has been known for long, but its significance has been perceived more recently. Demange, in his monograph on the organic changes associated with old age, states as follows:

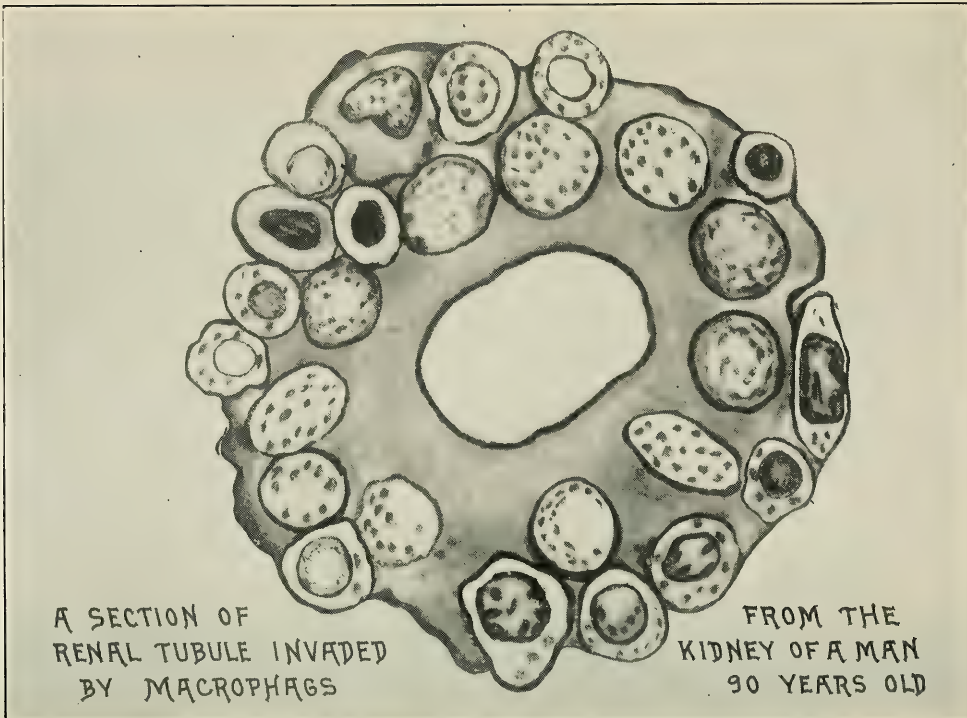
"'Besides atrophy and degeneration of the parenchymatous elements, there is to be observed a profound change in the framework of connective tissue, which serves to support the organs. In some cases the skeletal framework of an organ becomes more conspicuous, simply on account of the degeneration of the cells; this is the condition usually present in the liver of aged persons. More often, however, the connective tissue receives some kind of stimulation, which, although it does not amount to inflammation, brings about an active growth and resulting sclerosis. According to the particular case, the

hardening occurs in the form of isolated patches or strands, or affects the whole periphery or even the depths of the organ, and smothers the higher elements in its meshes, so producing a further degeneration. The cellular elements disappear gradually, connective tissue taking their place, and the change may be so profound, that as in the case of the prostate gland, the altered organ may actually transcend the normal size, partial or general atrophy, however, being more often the result.'

"Sclerosis in old people sometimes takes the form of hardening of the liver (cirrhosis of the liver) or of the kidneys (renal cirrhosis), but it is the arteries which are most commonly affected by it, producing a symptom of degeneration which is called arterial sclerosis."

"It might fairly be supposed that the hardening seen in many organs of the body during the period of old age is universal, and lends greater strength to the frame. The bones which are separated from one another in youth, become welded together in old age owing to the calcareous deposits in the joints, and the ossification of the joints between the vertebra frequently causes the backbone to assume the appearance of a continuous bone, the greater part of the cartilage having become ossified. In spite of this, and as though for the purpose of proving how physically full of contradictions is the period of old age, the human frame actually becomes lighter and the quantity of component mineral substance becomes less. This brings about a liability to fracture of bones in old people. The fracture of the neck of the femur is a constant cause of death in the

OSTEOCLASTS DESTROYING BONY MATTER
IN THE STERNUM OF A MAN AGED 81 YEARS



A SECTION OF
RENAL TUBULE INVADED
BY MACROPHAGS

FROM THE
KIDNEY OF A MAN
90 YEARS OLD

aged, as occurred for instance in the case of Virchow, one of the most distinguished medical scientists of the nineteenth century."

"In the brain the nerve-cells disappear; that is to say, the cells which subserve the higher function such as intellectuality, sensation, control of movements, and these are replaced by elements of a lower kind, in especially neuroglia, a kind of connective tissue of the brain. In the liver, the hepatic cells, of great importance to the nutrition of the organism, yield to connective tissue. In the kidneys, that tissue invades and blocks the tubes by which the necessary process of eliminating soluble waste matter is accomplished. In the ovaries, the ova, the specific elements which serve to propagate the race, are similarly eliminated and replaced by granular cells, a variety of connective tissue. In other words, a conflict takes place in old age between the higher elements and the simpler or primitive elements of the organism, and the conflict ends in the victory of the latter. This victory is signalized by a weakening of the intellect, by digestive troubles, and by lack of sufficient oxygen in the blood.

"The word conflict is not used metaphorically in this case. It is a veritable battle that rages in the innermost recesses of our beings. Distributed throughout every part of our bodies are certain cells which fulfill certain functions of their own. They are capable of independent movement, and also of devouring all sorts of solid matter, a capacity which has gained them their name of phagocytes or voracious cells. The function these phagocytes fulfill is a very important one, for it is they that congregate in vast numbers around

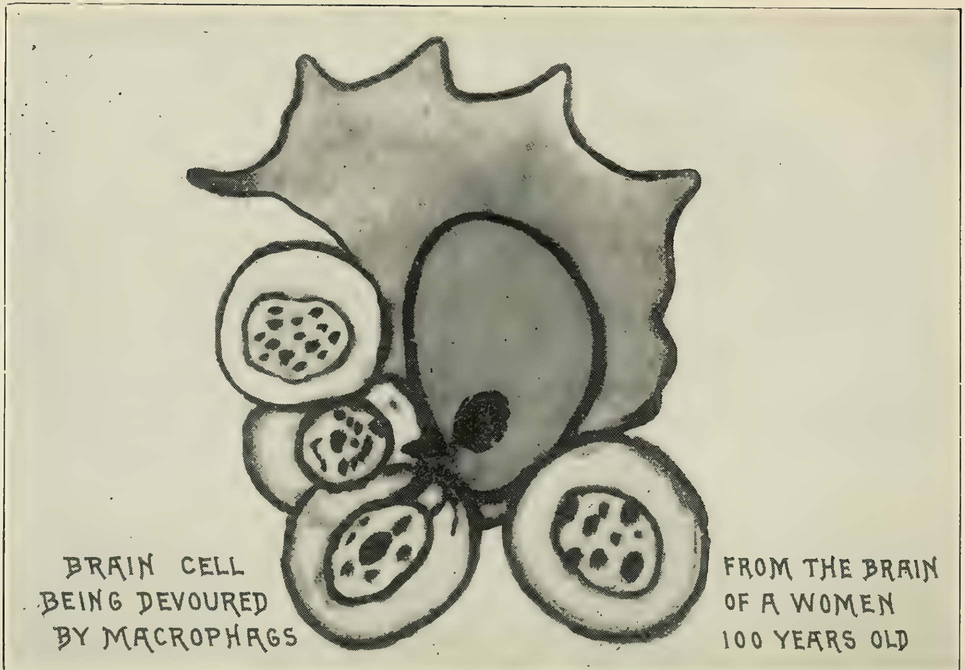
microbes or other harmful intruders, in order to devour them. Effusions of blood and other elements, on penetrating to parts of the body where their presence is disadvantageous, are absorbed by these phagocytes. In cases of apoplexy, where blood is shed into a part of the brain, setting up paralysis, the phagocytes cluster around the clot and devour the blood corpuscles it has encased.

"The phagocytes may be divided into small phagocytes, generally known as the microphags, and larger phagocytes called macrophags, which are sometimes active and sometimes still. The former, which are produced in the marrow of the bones, circulate freely in the blood, and occur as some of the white blood corpuscles, or leucocytes. They are distinguishable by their oval shape which facilitates their easy passage through the smaller blood-vessels, and allows their accumulation in great numbers in the exudations that form around microbes, These exudations may be formed extremely rapidly, and so may arrest infection in the case of many diseases.

"The absorption of extravasations of blood and the healing of wounds are the work of the macrophags. In a general way, the microphags may be said to rid us of microbes, and the macrophags to heal mechanical injuries, such as hemorrhages, wounds, and so forth. Macrophags possess a single unlobulated nucleus, and occur as white corpuscles in the blood, lymph, and exudations or as the fixed cells in connective tissues, the spleen, and the lymphatic glands, etc.

"The phagocytes are endowed with a sensitiveness of their own, and by means of a sense of

NEURONOPHAGS SURROUNDING NERVE CELLS OF CORTEX OF BRAIN FROM A DOG AGED 15 YEARS.


BRAIN CELL
BEING DEVOURED
BY MACROPHAGS
FROM THE BRAIN
OF A WOMEN
100 YEARS OLD

smell or taste are able to recognize the nature of their surroundings. According to the impression made upon this sense, they approach the object which arouses it, exhibit indifference to it, or withdraw from its vicinity. When, however, an infectious microbe finds its way into the body, the macrophags are attracted by its excretions and swarm into the exudations surrounding it. The macrophags play a very important part in bringing about senile decay. The atrophy of the kidneys in old persons is attributable to their agency. They accumulate in large quantities in these organs, clustering around the renal tubes which they ultimately cause to disappear. Having appropriated the place of the renal tubes, the macrophags proceed to form connective tissue, which thus takes the place of the normal renal tissue. A similar process occurs in the other organs that degenerate in old age. In the brains of old persons and animals, for instance, it is known that a number of nervous cells are surrounded and devoured by macrophags. Judging from investigations mentioned above, I think I am justified in asserting that senile decay is mainly due to the destruction of the higher elements of the organism by macrophags. This conclusion has been confirmed by means of direct observation stars. The same phenomenon may be observed in the case of parrots and dogs of advanced age, and in other animals.

"Hair, before it has lost its color, is full of pigment scattered throughout the two layers of which each hair is composed. At a given moment, the cells of a central cylinder of hair become active, and proceed to devour all the pig-

ment within their reach. Once they are filled with colored particles, these cells, which are a variety of macrophags generally called pigmentophags or more properly speaking chromophags, become migratory, and, quitting the hair, either find their way under the skin or leave the body. The coloring matter of the hair is removed in this way by chromophags, leaving the hair colorless.

"The process by which hair becomes white is of importance, because it shows that the activity of macrophags is a dominant factor in bringing about senile decay. The brittleness of old people's bones is probably due to a similar case, i. e., to the absorption and destruction of the framework brought about by macrophags invading the layers of bone."

Life Expectancy

Q. **What is life expectancy, and how does the life expectancy of men compare with that of women?**

A. Life expectancy is the number of years which the average individual may expect to live at any given age. The following table shows the life expectancy for males and females, and also the difference in life expectancy between city dwellers and those who live in rural districts, for ages one to eighty-five years:

Age Yrs.	Males	Females	Males in Cities	Males in Country	Females in Cities	Females in Country
1	49.86	53.24	47.32	55.06	51.39	57.35
5	55.11	57.39	53.09	58.74	56.19	59.82
10	51.07	53.31	49.13	54.53	52.22	55.54
15	46.66	48.87	44.72	50.10	47.77	51.07
20	42.48	44.66	40.51	45.92	43.51	46.86
25	38.59	40.69	36.54	42.06	39.46	42.95
30	34.70	36.79	32.61	38.10	35.52	39.05
35	30.94	32.95	28.87	34.14	31.67	35.10
40	27.32	29.15	25.32	30.20	27.88	31.15
45	23.77	25.36	21.89	26.27	24.14	27.18
50	20.32	21.67	18.59	22.43	20.53	23.27
55	16.98	18.13	15.45	18.68	17.10	19.47
60	13.95	14.90	12.68	15.23	14.04	15.93
65	11.24	11.96	10.26	12.10	11.32	12.64
70	8.83	9.38	8.14	9.36	8.99	9.76
75	6.75	7.20	6.33	7.02	6.99	7.38
80	5.10	5.37	4.91	5.20	5.31	5.40
85	3.90	4.08	3.83	3.91	4.08	4.05

Why Women Live Longer than Men.

Q. **Why do women live longer than men?**

A. The mortality statistics show six male deaths to five female decedents. Sufficient cause for the greater life expectancy in women is to be found in their being less addicted to the use of alcohol and tobacco. It is claimed that ninety per cent of all men smoke, while comparatively few women do so. The use of alcoholic liquors by women is much less than by men. Hunter has shown that the mortality of moderate drinkers is double that of abstainers, and according to Dwight, the records of the New England Mutual Life Insurance Company covering sixty years show that the mortality of smokers is 57.6 per cent greater than that of non-smokers.

A comparison of the mortality of the two sexes from various diseases is particularly instructive. 140 males die from disease of the arteries to 100 females. At the age of 20-24 years 300 males die to 100 females. At the age period

of 40-44 years 376 males die to 100 females. For the 50 years between 20-70 years the proportion is 245 male decedents from diseases of the arteries to 100 females. 170 males die of angina pectoris to 100 females.

So great difference in the mortality rate must be the result of some powerful cause acting upon large numbers of the population. Whatever this etiological factor may be, it must be an agent which possesses specific properties through which it is able to damage the blood vessels. Is there to be found any other agency so open to just incrimination in this connection as the practice of tobacco-using? Tobacco is known to produce specific effects upon the sympathetic nervous system and through this great system of nerves upon the blood vessels.

Claude Bernard, the great French physiologist, first noticed the contraction of the blood vessels caused by nicotine. (Brooks.) Bruce, Miller, Hooker, Hirschfelder, all have noted the same. The effects on old smokers is as great as on beginners.

Boveri gave nicotine to rabbits for eighty-four days, and found hardening of the blood vessels.

The great excess of male over female deaths begins at the age period from 15-25 years, the age when the smoking habit usually becomes established, and reaching its maximum at the age period of 40-44 years, the time of life when full maturity has been achieved and the old-age process naturally begins.

Angina pectoris, a highly painful disease of the heart, due to constriction of the vessels of the heart itself, is even more dominant as a cause

of death in males. The mortality statistics for 1915 show 170 male deaths from angina pectoris for 100 females, an excess nearly double that found in general diseases of the blood vessels.

Here again tobacco must be justly incriminated. Experiments upon animals have shown that the inhalation of tobacco smoke will cause hardening of the large arteries, extensive hardening of the arteries being found in a youth of seventeen who was a great cigarette smoker.

Is Race Vitality Increasing

Q. **Does not an increase in the average length of human life show an improvement in the vitality of the race?**

A. While the average length of life has been increasing in all civilized countries within the last three centuries, the proportion of centenarians to the total population has been diminishing.

At the present time the most highly civilized nations have the smallest number of centenarians, while the largest number is found among those people who still adhere most closely to the simple life. The Bulgarians, a people numbering only five millions, boast of 3,000 centenarians, or one in 1,700. In Spain, the proportion is one to 40,000; in France, one to 190,000; in England, one to 200,000; in Germany, one in 700,000. We have in this country one centenarian to every 25,000 of the population, but the number is rapidly decreasing as the natural result of the increased death-rate after middle life, due to the increasing mortality from chronic disease. It is inevitable that examples of

great age will grow less and less numerous so long as men and women cultivate the use of alcohol, tobacco, tea and coffee and other poison habits.

Our Nearest Relatives

Q. **What members of the animal kingdom are most nearly related to the human species?**

A. Modern physiologists place man and the higher apes in a special class known as primates.

In Metchnikoff's remarkable book, "The Nature of Man," many interesting facts are presented which clearly show the close relationship between man and the higher apes. According to Metchnikoff, Gruenbaum, of Liverpool, has been fortunate enough to procure a considerable quantity of the blood of three large anthropoid apes—the gorilla, chimpanzee, and orang-utan. He has been able to prove that the serum of animals injected with man's blood gives a precipitate not only with this blood but also with that of the above-mentioned apes. It was impossible for him to distinguish this precipitate as regards quality and quantity from that which is obtained with human blood.

"To verify this result, Gruenbaum prepared the serum of animals injected with the blood of the gorilla, chimpanzee, and orang-utan. These three kinds of serum gave precipitates with the blood of man. It is, therefore, evident that there exists between the human species and the anthropoid apes not only a superficial analogy of body and of the principal organs, but a close blood-relationship.

"Facts of this kind could not be foreseen when the theory of the simian origin of man was put

forward. In spite of this they have risen to confirm it in a truly astonishing way.

"It is, therefore, impossible to doubt that man is a member of the group of primates having a close connection with the higher monkeys of the present time. This result is of great importance in all questions relating to human nature.

"It would certainly be of considerable interest to know more exactly what steps were followed in the simian descent of man. On this question our knowledge is still very imperfect. In his researches on anthropoid apes, Selenka insists on a more intimate relationship between the chimpanzee and man. The great resemblance of the premolars and of the molars in the permanent dentition of the chimpanzee with human teeth appears to indicate that the chimpanzee and man have a common origin.

"A very distinguished German anatomist, Wiedersheim, has given in a pamphlet a resumé of our actual knowledge of the organs of man from the point of view of their descent. He has found fifteen organs which show in the human species a considerable advance on those of anthropoid apes. The chief of these are the lower limb, well adapted for a constant erect carriage of the body; the strengthening of the pelvis and of the sacrum, as well as the broadening of the more slender pelvis of the female; the curvature of the lumbar part of the vertebral column; the development of the buttocks and of the calves; the difference of certain muscles of the face; the nose; certain strands from the brain to the spinal cord; the occipital lobe of the brain; the greater development of the cerebral cortex, and, lastly,

the considerable differentiation of the muscles of the larynx which permits speech.

"But besides these progressive organs, Wiedersheim has counted seventeen decaying organs, still able to fulfill their physiological function in a more or less incomplete manner (amongst these are the decadent muscles of the leg and foot; the eleventh and twelfth pairs of ribs, the toes, the caecum, etc.), and not less than one hundred and seven rudimentary organs which serve no useful physiological purpose. To this category belong the coccyx—the vestige of a tail—the thirteenth pair of ribs in the adult, the muscles of the ear, the vermiform appendage, etc.

Professor R. L. Garner, who has devoted many years of his life to the study of the man-like apes of Africa in their native forests has made many interesting observations of the habits and social conditions of these creatures. He finds that they resemble in very many respects the lower human races. They live upon the natural products of the forest, chiefly fruits, nuts, and green shoots.

"They sleep on the back or side, like human beings, and often make their beds 18 to 25 feet from the ground. They have acute sight and especially hearing, but their sense of smell is not much better developed than that of man. The period of gestation is probably seven months. Twin births are exceedingly rare. Females are sexually mature at from 7 to 9 years; males a year or two later. The usual duration of life is 20 to 21 years. Rights of ownership are well respected among them."

Inbreeding

Q. **Does inbreeding through the marriage of near relatives tend toward race degeneracy?**

A. That depends upon circumstances. It is generally supposed that the marrying of persons who are of the same blood is likely to give rise to defective offspring. The laws of many states prohibit such marriages. Davenport summarizes the laws of the different States as follows:

1. Sibs (i. e. full brothers and sisters) are forbidden to marry in all States, and half-sibs in most States.

2. Parents and children are forbidden to marry in all States, and parents and grandchildren in all States excepting Pennsylvania.

3. Marriage between a child and parent's sibs (i. e. marriage between niece and uncle, nephew and aunt) is prohibited in all but four States.

4. Marriage between first cousins is prohibited in over one-third of the States, being either tacitly or specifically permitted in the other States.

5. Less closely connected relatives are prohibited from marrying in some States: for instance, second cousins may not marry in Oklahoma and marriage between a child and its parents' half-sibs is forbidden in Alabama, Minnesota, New Jersey, Texas, and a few other States.

According to King, recent experiments in the breeding of domestic animals "have shown conclusively that there is no general physiological law forbidding inbreeding and that the results obtained depend very largely on the character of the stock that is inbred."

The Ptolemys, who were the most famous and successful rulers of Egypt, afford an example of the closest inbreeding during several generations. Kings married their full sisters, queens married their uncles. Cleopatra, the last of the line to rule Egypt, was one of the most beautiful women named in history and in many other ways was most remarkable. There were no defects in the Ptolemy line. The Roman Caesars afford an example of inbreeding of the opposite sort. Julius Caesar was reputed to be an epileptic.

According to the laws of heredity, if a man who has tuberculosis tendency marries a woman of like tendencies, the children are likely to be predisposed to tuberculosis.

The marriage of cousins is dangerous when there is a history of defective mentality. Among the children of such a marriage, one in four would be practically certain to be completely defective, and one-half the children would be like their parents, and would transmit to their children the same defective tendencies.

Popenoe cites several instances in which intensive inbreeding has produced no bad results. He says, for example: "What about Smith's Island off the coast of Maryland, where all the inhabitants are said to be interrelated, and where a physician who lived in the community for three years failed to find among the 700 persons a single case of idiocy, insanity, epilepsy or congenital deafness?

"What about the community of Batz, on the coast of France, where Voisin found five marriages of first cousins and thirty-one of second cousins, without a single case of mental defect,

congenital deafness, albinism, retinitis, pigmentosa or malformation? The population was 3,000, all of whom were said to be interrelated.

"What about Cape Cod, whose natives are known throughout New England for their ability? 'At a recent visit to the Congregational Sunday-school,' says a student, 'I noticed all officers, many teachers, organist, ex-superintendent, and pastor's wife, all Dyers. A lady at Truro united in herself four quarters Dyer, father, mother and both grandmothers Dyers.' "

Heredity of Acquired Characters

Q. **May acquired characters be inherited?**

A. Yes, but the characters must be really acquired. Weisman cut off the tails of 300 successive generations of rats, but the last generation produced tails equal to any of their ancestors. It has been clearly proven that mutilations are not inherited, but bodily changes resulting from years of special activity or changes produced by bad habits, such as alcoholism or other indulgences which affect the entire body, may influence the germ plasm in such a way as to influence the progeny.

Lamar, 100 years ago, maintained that characters acquired by an animal's own efforts, through the improvement of its bodily functions, might be inherited. He formulated two laws relating to heredity, which are as follows:

First Law: In every animal which has not exceeded the term of its development, the more frequent and sustained use of any organ gradually strengthens this organ, develops and enlarges it, and gives it strength proportioned to

the length of time of such use; while the constant lack of use of such an organ imperceptibly weakens it, causes it to become reduced, progressively diminishes its faculties, and ends in its disappearance.

Second Law: Everything which nature has caused individuals to acquire or lose by the influence of the circumstances to which their race may be for a long time exposed, and consequently by the influence of the predominant use of such an organ or by that of the constant lack of use of such part, it preserves by heredity and passes on to the new individuals which descend from it, provided that the changes thus acquired are common to both sexes, or to those who have given origin to these new individuals.

These laws are illustrated by the increase of speed of race horses, which has occurred in the last century, as shown by the following table, showing the speed of famous trotting horses:

1818	Boston Blue	3:00
1830	Bull Calf	2:47 ¾
1839	Dutchman	2:32
1845	Lady Suffolk	2:29 ½
1859	Flora Temple	2:19 ¾
1874	Goldsmith Maid	2:14
1892	Nancy Hanks	2:04
1912	Uhlan	1:58

A study of the history of racing horses appears to show that the winners of a new generation of racing horses are the progeny of racing parents who were prize winners. A study of the records of stock raisers show that race horses produced race horses only when they themselves have been raced a number of years, and they ceased to be fathers and mothers of

racers after they were retired to the breeding stable. According to Fisher,

"History shows that two hundred of the sons of Almont were used for breeding purposes. Of these, ten per cent were raced, while ninety per cent were kept at home because they were considered too valuable for breeding purposes to have their energies sapped upon the track. As the successful sires of racing stock, the raced sons, however, outranked the unraced as sixteen to one."

The same principle seems to be demonstrated in the breeding of dairy cattle. Says Fisher,

"It is characteristic of cows to produce a certain quantity of milk per day when their first calves are born. With proper care and regular milking the amount produced is decidedly larger when the second calf is born, still larger with the third and so on up as far as the present records go. The matter is officially recognized by breeders, who for the judging of cattle, follow a standard, which in the case of the Holstein-Friesian Association requires that the amount of milk produced in the first ten days following birth of a calf shall not fall below the following amounts:

For two-year-olds	354 lbs.
For three-year-olds	432 lbs.
For four-year-olds	511 lbs.
For five-year-olds and over	589 lbs.

"While the official standard does not go higher, it is known that the actual increase in milk-producing power continues beyond six years.

"Since increased milk production with successive calves is dependent upon the increased ex-

ercise to which the udders are subjected through milking, it was to be expected, other things being equal, and with the inheritance of acquired characteristics possible that those calves and their descendants should prove best in milk production in a new generation which had been born latest in the calf list of any mother.

"Investigation has shown that the probability that a calf will become a great milk producer rises steadily as its number in the calf series of a given cow rises."

The genealogical trees of our best New England families show, according to Fisher, "a normal or average breeding rate of a little better than three generations to the century. More specifically, the average of fathers and mothers at the time of birth of their children, is short of thiry-three years. New England blood is acknowledged as good stuff, yet how does this already slow breeding rate compare with that of the great men of history? How does the New England rate of sixty-six years from birth of a grandfather to birth of grandson compare with the rate when the grandson is recognized as eminent? History speaks in no uncertain values. Instead of the sixty-six years or less, the following numbers are found:

Augustus Caesar	118	years
Audubon	115	"
Lamarack	110	"
Franklin	108	"
Washington Irving	107	"
Wallaston	107	"
Sulla	105	"
Montmorency	105	"
Copernicus	100	"
Gustavus Adolphus	98	"

Montalembert	96	years
Bunsen	95	"
Ptolemy	95	"
Watt	94	"
Dumas, the Elder	93	"
Goethe	92	"
Pope	92	"
Whittier	91	"
John Hunter	90	"
Bach	87	"
John Herschel	85	"
Robert E. Lee	78	"
Charles Darwin	78	"
Abraham Lincoln	76	"
Grant	74	"

"In a list of 571 eminent men, with 860 birth ranks thus studied, the rate of breeding showed an average of 40.7 years from father to son, instead of the New England 33. If the probability of being eminent when born of a father between thirty-five and forty, is taken as a unity, the probability if born at twenty-five is less than one-fifth as great. Ascending the age scale, the probability at fifty to fifty-five is five times that at thirty-five to forty; and over sixty, it is over ten times that.

"Alexander the Great was the son of Philip of Macedon when Philip was 26 years old. Philip himself was born when his father, Amyntas II. was 63; Amyntas II. in his turn was the grandson of Alexander I., 90 years covering the two generations intervening.

"Aristotle was the son of Nicomachus at 58, who was himself the son of an old man.

"Confucius was the son of his father at 71, his mother being the youngest daughter of a governor. If it is asked what became of Confucius' blood, it may be added that his only son was born when Confucius was 19.

"Benjamin Franklin was the son of Josiah Franklin at 51, who in turn was the son of his father at 57, in his turn the son of his father at 70. 'Franklin was the youngest son of the youngest son for five generations back,' that is, all five ancestors were the sons of their parent's mature years. Franklin was the son of his mother at 50. Franklin's only son was born when Franklin was 23, and was of but average ability.

"Goethe was the son of his father at 39, who in turn, was the son of his father at 53. Goethe's mother was 38.

"Lamarack's father was 42 when the illustrious son was born. The father was himself the grandson of De Monet, born over 110 years earlier."

Pre-natal Influence of Mental Impressions

Q. **Is there any scientific basis for the belief in prenatal influences which are supposed to produce birth marks and other peculiarities?**

A. Scientific research has shown that "There is as much reason," says Popenoe and Johnson, "to expect the child to grow to resemble the cow on whose milk it is fed after birth as to expect it to grow to resemble its mother because of prenatal mental influence."

William Hunter, a famous English physician, related that while physician in a lying-in hospital, he had in many thousand cases asked the mother, before her confinement, whether anything had affected her imagination, and recorded the answers; and absolutely not one case came right, though, when the child was anything remarkable, they afterwards made the cap to fit."

Eugenics Registry

Q. **What is the Eugenics Registry?**

A. At the Race Betterment Conference, held at the Battle Creek Sanitarium of Battle Creek, Michigan, in January 1914, the suggestion was made that a register should be established to be known as the Eugenics Registry, which should provide for the registration of persons of superior mental and physical qualifications, especially those descended of parents and grand parents of like character. Since the conference referred to the Registry has been organized and is now being conducted under the supervision of a board consisting of the following persons:

David Starr Jordon, President Leland Stanford University, Irving Fisher, Professor of economics, Yale University, C. B. Davenport, director of the Eugenics record office, Cold Spring Harbor, Luther Burbank, Santa Rosa, California, Doctor J. H. Kellogg, secretary, Battle Creek, Michigan; Prof. O. C. Glaser, executive secretary.

Full information concerning the registry and the conditions of registration may be obtained by addressing The Eugenics Registry, Battle Creek, Michigan.

Increase of Insanity

Q. **Is insanity increasing?**

A. Mental defectives have increased within the last fifty years at the rate of 900 per cent in a century. At the present rate of increase, in fifty years from the present time, 9 per cent of the total population will be insane, idiotic, imbe-

cile, or otherwise defective. According to Doctor Davenport, mental defectives now constitute 1 per cent of the total population. The recognition of a new class of mental defectives, the moron, gives us the key to a large number of social problems and explains the rapid increase of a certain type of criminals and the growing army of ne'er-do-wells. Of all classes of mental defectives this class is by far the most dangerous because not easily recognized except by experts, and so left to reproduce and increase without restriction.

An eminent English alienist recently made the assertion that the whole human race will in time become insane. The writer does not share this pessimistic view for, notwithstanding the fact that at the rate at which mental defectives are at present increasing, the whole race would become insane, idiotic or imbeciles within less than three centuries, so sad a calamity is not likely to befall the human family, for long before the race reaches the state of universal incompetency, the impending danger will be appreciated, the cause sought for and eliminated, and, through eugenics and euthenics, the mental soundness of the race will be saved.

Physical Superiority of Savages

Q. **Is it true that savages have better bodies than civilized men?**

A. Civilization is destroying us. The civilized man has almost entirely lost his sense of smell, whereas the savage has a keen smell. It is said that certain tribes of South America can scent a member of another tribe rods away.

Defective eye-sight is growing more and more common among civilized people.

Moreover the savage is able to hear far better than the civilized man, while his sense of taste is superior. The savage, wandering through a forest, knows as soon as he plucks a berry or other fruit and touches it to his tongue whether or not it is fit to eat. The civilized man sitting down to a hotel table gives little consideration as to the suitability of the food, but eats what he finds on the menu regardless of consequences.

The endurance of the savage is also incomparably above that of civilized man. Because of their extraordinary vitality savages recover from wounds that would prove fatal to a man with habits customary with civilized people.

Longevity of Brain Workers

Q. **Is it true that most brain workers are short-lived?**

A. An investigation by George M. Beard showed that the average length of life of 500 of the greatest men in history was fourteen years longer than that of the average man.

The Public Health

Q. **Is sickness increasing?**

A. Statistics gathered by Tredgold from various friendly societies, aggregating a membership of nearly a million and a half, demonstrate that, notwithstanding the great advance in the prevention of disease through public sanitation and improvements in therapeutics, the average amount of sickness at all ages has

steadily increased during the last half century. The report of actuaries, appointed in connection with the National Insurance Act enacted by the British Government in 1911, shows the increase of sickness, which has occurred during the last thirty years in several large friendly societies.

This report shows a very marked increase of sickness at all ages of life, from sixteen to seventy years, ranging from fourteen per cent to seventy per cent, the greatest increase being at sixteen to nineteen years and the next greatest fifty-five to sixty-nine years.

Birth Rate

Q. **Is the birth rate decreasing?**

A. Professor Cattel in a recent paper, stated that if the decline of the birth rate continues during the balance of the century as rapidly as during the last few years, in the year 2,000 no babies will be born in the United States.

The birth rate is rapidly declining in almost every civilized country of the globe, but especially in the older parts of this country.

Jews' Health

Q. **Is the Jewish race healthier than other races?**

A. Yes, and one reason is that they have followed so many of the laws of hygiene for so many generations. They have not eaten pork, for example, and they have taken care to investigate carefully all animals before they eat them. As a race, the Jewish people have not been very large eaters of meat.

Dust

Q. **Of what does atmospheric dust consist?**

A. The dust of the air has many sources. In cities it consists largely of the excreta of animals dried in the sun and powdered by the traffic of the street. Dust is most abundant in large cities. In London one cubic inch of air contains over two million dust particles. Even the air of the ocean, far from land, may contain from ten thousand to thirty thousand dust particles per cubic inch. The air of high mountains is the freest from dust. Even the purest mountain air observed was found to contain 1500 dust particles to the cubic inch. Scientists have discovered that all space is filled with very minute particles—cosmic dust produced by the destruction of meteorites. At a distance of fifteen miles above the earth, the atmosphere may contain quantities of volcanic dust.

Street dust is highly dangerous. It should be suppressed by frequent and thorough street flushing. The accumulation of house dust should be prevented by a vacuum cleaner. The old fashioned broom and the feather duster should be discarded as excellent dust distributors. The inhalation of dust is highly injurious, not only because ordinary dust consists very largely of disease germs but also because of the irritation produced by the accumulation of dust in the lung tissues. The lungs of coal miners are nearly as black as coal. The lungs of stone cutters are full of grit.

Ventilation

Q. **What is the best means of ventilating a room?**

A. Window ventilation when properly managed is not only highly efficient but very satisfactory. It must be remembered that two openings must be supplied, an entrance and an exit for the air. This may be accomplished by a single window by lowering the window at the top and raising it at the bottom. The chief objection to this plan is that unpleasant drafts are likely to be experienced. In cold weather this may be a matter of considerable gravity. There are two very simple methods of obviating this difficulty:

1. The window board.

A thin board six or eight inches wide is fastened across the bottom of the window opening resting on the sill and made tight at each end. Now when the window is raised the movement of air will strike against this board and will be deflected toward the ceiling. An incoming current after passing several feet in an upward direction will gradually mix with the air and thus draft will be obviated.

2. The window screen.

This consists of a frame covered with muslin one or two feet wide fitted into the window opening tight against the lower sash. When the lower sash is raised the air rapidly filters in without producing a draft. The screen has also the advantage that in windy weather it will exclude dust.

Window Tent

Q. **Is the window-tent a good thing?**

A. The window-tent is certainly an excellent means of securing pure, cold air during sleep in the cold months.

Fireplace Ventilation

Q. **Does an open fireplace afford sufficient ventilation?**

A. A fireplace is a good ventilator, and will aid in supplying an abundance of fresh air, provided a window is open in the room to create a current.

It is important that the fireplace should have a good draft. An open coal or wood fire is in every way preferable to a gas fire. When installed in the usual way, gas grates are very unhealthful.

Gas Heating

Q. **Is gas heating of rooms healthful?**

A. A living room should never be heated with gas unless care is taken to thoroughly remove the products of combustion, so that none of them are mixed with the air of the room. The gas stove has been responsible for many deaths. The same applies to oil stoves.

In any room where gas or oil stoves are burning, there must be an open window. Open the window at the top, and also insert a window board under the lower sash so air can enter the room between the lower and upper sashes.

Furnace Heat

Q. **Is furnace heat wholesome?**

A. Yes, if the furnace is a good one, and does

not leak smoke or gas. The air may be too dry.

There should be a water pan in the furnace, and this should be kept supplied with water. Care should be taken to bring fresh air to the furnace from out of doors, and not from the basement, cellar, or front hall.

The House Fly

Q. **What diseases are communicated by the common house fly?**

A. Modern scientific research has demonstrated that the house fly is a carrier of many different kinds of germs which are productive of disease.

Among the various diseases which have been proven to be communicable through the medium of the house fly are the following: tuberculosis, typhoid fever, scarlet fever, the dysenteries, cholera, tetanus, eye contagions, anthrax, glanders, infantile paralysis, diphtheria, meningitis, leprosy, bubonic plague, carbuncle, infected wounds, erysipelas, and the eggs of parasitic worms.

The Dangerous Fly

Q. **How do flies distribute disease?**

A. The fly may distribute disease in three special ways:

1. By the germs clinging to its feet, legs, wings, and proboscis.

2. Its body, when covered with bacteria, may cause infection when crushed or drowned, if it falls upon or into anything that goes into any person's mouth.

3. By its excreta. Investigation has shown that most germs pass unharmed through a fly's body. The annoying fly specks, always the bane of the housekeeper, are known *danger spots.*

The fly feeds on filth, and it also breeds in filth. It makes filth, it wallows in filth, and the filth clings to its feet, legs, wings, and body. It carries filth to everything it touches, and not only filth, but the germs of many deadly diseases that abound in filth.

There is only one radical *cure*—absolute cleanness. The number of flies indoors may be lessened by the prohibitory measure of screening the house windows and doors, and this should be done early.

Keep foods of every sort and particularly milk in screened enclosures or safes. See to it that garbage cans are kept closely covered, that they are emptied daily and well scrubbed before being used again, or that the collector gives clean ones in exchange. To make assurance double sure add a half pound of copperas to a pail of water and sprinkle weekly the place where the garbage can is kept. A sprinkling of chlorid of lime serves the same end. Do this to every moist nook and refuse pile appearing to offer a breeding place for flies. Treat vaults by a plentiful use of dry earth at all times and at least once a week to a thorough sprinkling with crude petroleum or copperas.

The only sure way to insure freedom from flies, is to prevent their breeding and to hold forth no attraction for them.

Mosquitoes

Q. **What measures are effectual in destroying mosquitoes?**

A. The mosquito requires still, shallow water for breeding. A little kerosene, just enough to coat the surface sprayed over pools and puddles, ponds, rain barrels and other water frequented by mosquitoes is an efficient remedy. Not only is it destructive to the larvæ, but the grown insect will not lay her eggs on oiled water.

All breeding places should be done away with. Drain or fill in the pools, ditches and depressions where water stands. Even post holes and cow tracks should receive attention. Wherever a cupful of water can stagnate, there mosquitoes can breed.

Treat with oil all standing water that cannot well be drained or screened. Sprinkle or spray the oil over the surface till all the water is covered with an unbroken film of it. An ounce of oil may thus be spread over ten or fifteen square feet of water surface. For small areas it may be poured on the water. The oil must be renewed at least every three weeks. Rain or wind that ruffles the water surface may make a renewal necessary sooner. Standing water for house use, as the cistern, rain barrels and tanks may be protected by screens. The precaution must be taken, however, to clean away weeds, grass and bushes from the margin of the water that there be no hiding places for adult insects and no harborage for wigglers, where they will be inaccessible to the fishes.

The banks of brooks should be evened so as to do away with any marshy places or pockets where water can stagnate.

Artesian Water

Q. **Is artesian water always certain to be pure?**

A. Artesian water is generally free from bacteria and its use is comparatively safe. Very deep artesian wells are practically always safe, but artesian wells which do not penetrate the rock for a considerable distance may be contaminated by surface water.

Softening Water

Q. **How may water be softened for domestic use?**

A. Hard water contains lime and usually magnesia, sometimes also iron. By the addition of "quick lime" and soda ash in proper proportion most of these chemicals are rendered insoluble, and appear as a sediment. After standing a few hours the water becomes clear. The right proportions of lime and soda ash must be determined in each case by a chemical analysis of the water to be softened. Water is softened to some extent by boiling.

Water softening plants which operate automatically are in successful operation in many cities and with entire success.

Typhoid Germs in Water

Q. **Can water containing typhoid fever germs be rendered safe for drinking or culinary purposes?**

A. Researches conducted by the United States government and other reliable authorities have in recent years demonstrated that water infected to such a degree as to be highly dangerous if used for drinking purposes may be rendered safe by the addition of liquid chlorine or hypochlorite of lime in proportion of one part to a million of water.

Chlorine destroys the dangerous elements without imparting to the water any injurious properties. Chlorine is one of the constituents of the gastric juice and is not harmful in the quantities which are found efficient for the purification of water. To be reliable, this method must be employed under the supervision of an experienced chemist. When thus used it has proven very successful and has stopped typhoid epidemics in many communities. This method should be regarded, however, only as a temporary expedient to be employed only until a pure water supply can be secured.

Alkali in Water

Q. **Is water which contains alkali injurious when used for drinking and cooking purposes?**

A. Waters containing alkalis are always more or less injurious when used internally. Such water should not be used habitually.

Water Testing

Q. **How may water be tested for purity?**

A. There are no simple tests for pure water for home use which can be relied upon. The water must be sent to a bacteriological labor-

atory for careful examination. Chemical tests are not sufficient. Water which, as tested chemically, may seem perfectly pure, may be deadly because of the presence of germs which could not be detected except by bacteriological analysis. Any State Board of Health will analyze water.

Water Sterilization

Q. **How long should water boil in order to become sterilized?**

A. Perfect sterilization of water requires heating for half an hour at a temperature of 240° *F.*, but this is rarely necessary. The dangerous disease germs likely to be found in water, such as typhoid and cholera germs, are destroyed by boiling for ten or fifteen minutes. The spores of dysentery germs may survive boiling, however, requiring a higher temperature for their destruction. Water which has been contaminated by human excreta may not be rendered wholly safe by boiling, though it is then much less dangerous. Boiling three days in succession will make the water safe.

Rain Water

Q. **How can one make sure of collecting rainwater so it will be pure?**

A. Rainwater is always more or less impure as it collects dust by passing through the air. Considerably more dust and filth is collected from the roof. The quality of rainwater can be greatly improved by permitting the first water which falls to escape. Rainwater is not likely

to be contaminated by any sort of roofing material in common use.

Purification of Water by Chlorin

Q. **Is there any chemical substance by the use of which polluted water may be rendered safe?**

A. Within recent years great use has been made of chlorin as a means of rendering impure water safe for use. Many epidemics of typhoid fever have been arrested by treating the water with chloride of lime. It has been found that about one part of chlorin in one million parts of water will destroy the bacteria and render the water safe without impairing its quality for culinary and drinking purposes.

An eminent New York physician has recently devised a chlorin compound which can be used in an emergency for the purification of drinking water. The compound is highly concentrated and presented in the form of a small tablet, one of which dropped into a glass of water and dissolved will in the course of a few moments destroy any dangerous bacteria which it may contain. It is hoped that this disinfecting tablet may be of service to soldiers at the fighting front.

Vaccination

Q. **Does vaccination prevent smallpox?**

A. Vaccination unquestionably mitigates the evils of small-pox. When proper care is taken to perform vaccination with good virus, there is very little chance, indeed, of any ill consequences arising from it and a high degree of protection is offered.

Disinfection of Clothing

Q. **How may infected clothing be disinfected?**

A. There are many ways in which clothing may be disinfected. The best method is heating in a steam sterilizer for half an hour. Another is to boil for one hour in a saturated solution of common salt. The addition of salt will raise the temperature a few degrees above boiling point and insure thorough destruction of disease germs and germ spores.

Still another very excellent method is formalin fumigation. The articles may be placed in a small room or closet, or in a box especially prepared for the purpose, and exposed to the fumes of formalin by burning a formalin candle within the enclosure. Such candles can be obtained at any drug-store, and are accompanied by full directions for their use.

Bad Smells

Q. **Is there danger in a bad smell?**

A. In general, bad smells are unwholesome and dangerous.

Before the discovery of germs there had come to be quite general recognition of a definite relationship between bad smells and ill health. Even malaria, as its name indicates, as well as many other maladies, was regarded as being caused by breathing contaminated air, though now we know that the disease owes its origin to infection with the parasites through the bite of a certain species of mosquito. The discovery of bacteria, however, by Pasteur, brought to light

a cause behind the bad smell, the mischievous germ, of which the foul-smelling gases were excretory products. The conclusion was soon formed that the real cause of a disease was not the bad smell itself but the germ which produced the bad smell, and that bad odors, although inconvenient, were after all, not so dangerous or deadly as had formerly been supposed.

Within recent years, however, extensive observations have been made chiefly by Italian investigators which show that bad odors are in themselves the cause of disease. This subject has recently been investigated in the United States by Winslow and David Greenberg of Yale University, to whose report we are indebted for the facts here presented. These investigators tell us that in experiments made by Alessi of the University of Rome, "rats were exposed to putrefactive gases by placing their cages over an untrapped water-closet,—the guinea pigs and rabbits by placing beneath their cages vessels of excrementitious substances. The animals exposed to the gases of putrefaction "lost their usual vivacity and pined away, in spite of eating voraciously."

In further experimentation with these animals it was found that they were easily infected by colon or typhoid germs, whereas animals which had not been exposed to putrefactive gases escaped injury.

The animals which had been exposed to the putrefactive gases were made seriously ill and a large proportion of them died, the typhoid or colon bacillus injected (as the case might be) being usually isolated in nearly pure culture from the blood, spleen and other organs.

Puntoni, an Italian investigator who also studied this subject, showed that mice exposed to putrefactive gases often died within twelve hours, showing great changes of the liver and kidneys and even the intestines, due to the elimination through these organs of the poisons absorbed into the blood.

Puntoni reports a series of experiments in which white rats were fed for periods of 15 to 20 days on food infected with typhoid and paratyphoid bacilli. After this period the animals were placed in sterilized cages and fed on dry foods under which conditions the typhoid and paratyphoid bacilli quickly disappeared from their feces (within 48 hours). Three to fifteen days later the rats were exposed to putrefactive gases as above, and after they had succumbed to the toxic action, typhoid bacilli were isolated from the intestinal contents in 3 out of 13 cases, paratyphoid A in 1 case out of 11, and paratyphoid B in 1 case out of 9. Puntoni concludes that "when putrefactive gases are respired, they may injure the intestinal wall, reviving and making virulent the pathogenic microbes always present in the intestines."

Winslow and David Greenberg, in experimenting with young guinea pigs, found that an exposure to fecal odors produced a marked effect on growth and development.

The Hair Brush

Q. **Is the hair brush a source of danger from infection?**

A. Yes. As a necessary toilet article, the hair-brush is supposed to gently massage the

scalp, keep the hair free from dust and generally promote the health and lustre of the hair.

Recent investigations conducted by the Louisiana State Board of Health tend to show that the average hair-brush is a suitable candidate for fumigation and cremation.

The result of the laboratory examination of 405 hair brushes gathered from barber establishments from 13 different points in the State suggests the importance of attention to the hygiene of hair brushes in public shops dealing with all conditions of men and women.

Cultural examinations demonstrated the presence of moulds, epithelia, contagious disease germs, and dirt that bore witness to the uncleanliness of the hair brushes chosen at random from shops of various grades.

The washing of brushes with a five-per cent carbolic acid soap or, preferably, thorough sterilization, is a precautionary step which safeguards patrons of commercial establishments.

Incidentally, the provision of individual hair brushes in barber shops and in the home recommends itself as necessary sanitary measures. The individualization of hair brushes, however, does not lessen the necessity for their periodic cleaning. The scalp and hair are collectors of extraneous material, some of which is undoubtedly disease producing. The hair brush affords an opportunity for autoinfection, especially in the presence of lice, boils of the scalp, or similar evidences of pyogenic infection.

Air Moisture

Q. **Is it necessary to add moisture to the air in cold weather?**

A. There is good evidence for believing that the addition of moisture to air which is unusually dry is a matter of great importance to persons in health, as also to those suffering with certain forms of disease, particularly pulmonary difficulties.

The air should not be saturated, but should contain sufficient moisture so that it will not cause unpleasant dryness of the throat, eyes, and skin. The requisite amount of moisture may be obtained by evaporation of moisture in open vessels upon the stove, in a pan provided for it in the furnace, by means of moistened linen cloths or sponges placed before registers, and in a variety of other ways. Attention to this point is particularly necessary in winter, when out-of-door air, on account of its low temperature, contains a much smaller proportion of moisture than at most other times.

Another convenient method of moistening the air in houses which are heated by steam is to have a jet placed in the fresh air intake. The amount of moisture required in average cold winter weather is considerable.

In the warm season of the year the degree of saturation of outdoor air and that within doors is about the same. In the winter season, however, owing to the higher temperature of in-doors, it is very much drier unless watery vapor is added by artificial means. This is owing to the fact that air acquires by increase of temperature a greater capacity for absorbing moisture.

Method of Moistening the Air

Q. **What is the best method of moistening the air of living rooms in cold weather?**

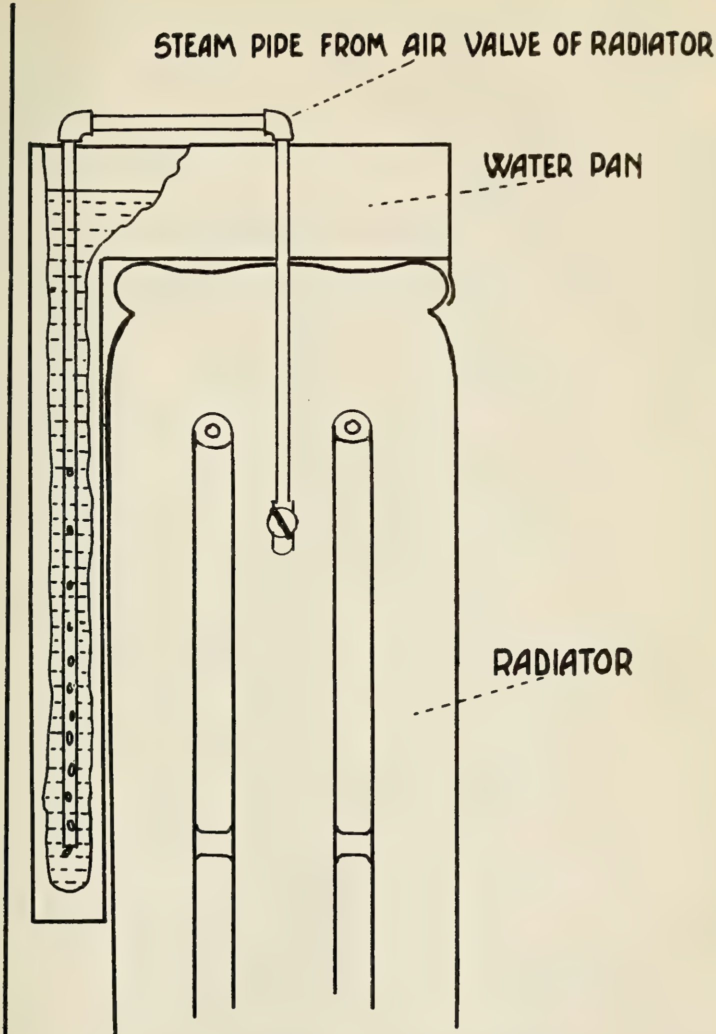
A. A plan which the writer has found most satisfactory is a steam jet when steam heating is employed. A steam jet in the main hot air duct near the heater prepares the air for the whole house at once, and may be easily regulated to meet varying weather conditions. During a January or February thaw, when the air is saturated with moisture, no addition of moisture is needed. At such times evaporating pans become a real nuisance because of the penetrating odor which they continually give off.

In a house heated by a furnace the problem is much more difficult. The best plan the author knows is one which necessity compelled him to work out some years ago. A moisture box is so arranged that the air may be made to pass over a series of wet cloth surfaces or may be diverted by means of valves so that it does not touch the moist surfaces.

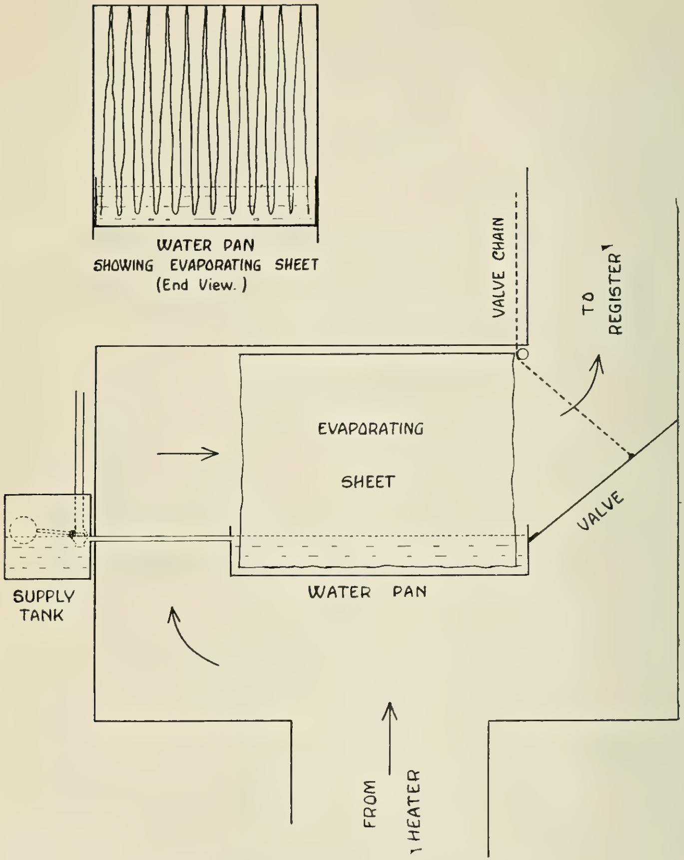
The accompanying cut shows the construction of a hot air water evaporator which is inexpensive and efficient. The moistening chamber is four feet long, two wide and two and one-half feet high.

The water pan is two feet square and four inches deep, with two opposite sides extending one foot high.

It may be made of galvanized iron, but copper is preferable. In the bottom of the pan is laid a wire grating consisting of twelve transverse bars. Another similar grating with thirteen cross bars is provided for the upper side



Air Moistening Device for Radiator



AIR MOISTENING DEVICE

f. r Furnace

Galvanized wire about one-sixteenth of an inch in thickness is necessary to give proper rigidity. The ends of this upper grating are attached to the highest sides of the water pan. Upon these gratings is stretched the cloth for the evaporating surface as shown in the diagram.

The best fabric for the evaporating strip is bleached muslin (two thicknesses) or cheese cloth (four thicknesses). Old sheeting is excellent. The strip should be seven yards long and two feet wide. A narrow hem should be made at each end and into it should be slipped a heavy wire to facilitate the stretching of the strip over the gratings. Now, beginning at one of the lower gratings, one end of the strip is attached, binding the end wire of the strip firmly to the first cross piece of the grating, and the strip is then passed over the first cross bar of the upper grating and so on until the end is reached, which is secured to the last bar of the lower grating. Care must be taken to make the strip smooth and taut.

When water is put into the pan it will creep up the cloth by capillary action and keep the whole surface moist. The open spaces are two inches wide at the widest part, and so will allow the free movement of air through the moistener. The evaporating surface presented to the circulating air is eighty square feet.

Provision is made for filling the pan by a pipe with funnel-shaped mouth, passing in at one side. Water may be applied at stated intervals as found necessary or by a small tank with float valve so adjusted as to keep the water at a fixed level. This can be easily arranged by any plumber.

The relation of the hot air pipe to the water pan is such that the pan receives the full benefit of the hottest air as it leaves the furnace, and so the water will be maintained at boiling point.

The valve or damper renders possible complete control, by mixture of the dry air and moist air in any proportion desired. When the valve is up and closed tightly over the outlet of the evaporator, the air will pass directly from the furnace to the registers without having any vapor added except the small amount that may pass back into the incoming current.

The valve may be adjusted at any intermediate point that may be desired and may be controlled from above by a small chain or wire cord as shown.

The original cost of an air moistening device is of no account compared with the saving of ten to twenty-five per cent of the total coal consumption for heating an ordinary home. It must be remembered that with an efficient air moistener the temperature of living rooms should not at any time exceed 65° F. and may be 60° or even less without discomfort, with proper care in relation to clothing the feet and legs.

Good Illumination

Q. **What is the best means for protecting the eyes from injury from artificial light?**

A. 1. Don't judge illumination by the brightness of the lamps. A well-shaded lamp may look dim, because it is well shaded, but yet be giving first-class light for working purposes. Judge the light by the way it helps you to see what you are looking at.

2. Don't work in a flickering light.

3. Don't expose the eyes to an unshaded light.

4. Don't face the light. When reading or writing it is best to have the light come from the left and from above the shoulder, so that no shadow will be cast on the page which you are reading.

5. Don't let lamps and globes get dirty.

6. Use light wall-paper or tinting. Dark walls absorb light strongly, instead of reflecting it. A very dark wall-paper or dark wood finish may require three or four times as much light as a really light finish. Reds, greens and browns reflect only ten to fifteen per cent of the light which falls on them. White, cream color and light yellowish tints reflect over one-half the light.

7. Indirect lighting is greatly preferable when sufficient.

Give your eyes every advantage when using them in artificial light.

The Gum Chewing Habit

Q. **Is the chewing of gum harmful?**

A. Yes. The constant activity of the salivary glands induced by gum chewing, especially when flavored gum is chewed, exhausts the glands so that they lose their power to digest starch, a very important function which is necessary for good digestion. This has been proven by actual experiment. A man was made to chew gum constantly for several hours. At the end of the first hour there was slight diminution in the digestive power of the saliva. At the end of two hours

there was a very marked loss of digestive activity and at the end of four hours, when the experiment was terminated, the saliva had almost entirely lost its activity. The habit of chewing tobacco or gum exhausts the salivary glands and thus lays the foundation for indigestion. The thorough chewing of the food is essential to good digestion; but gum chewing is a useless and more or less harmful practice.

The habit of gum chewing is likely to produce "sour stomach" by interfering with the digestion of starch through lessening the activity of the saliva. Imperfectly digested starch absorbs the pepsin of the gastric juice and thus prevents the combination of the hydrochloric acid with the protein of the food. The large amount of hydrochloric acid left over in consequence gives rise to acid dyspepsia or hyperchlorhydria, which, in turn, may give rise to gastric or duodenal ulcer. The so-called "pepsin" and other flavored gums are especially harmful.

Protoplasm

Q. **What is the meaning of the word "protoplasm"?**

A. Protoplasm is the technical term which scientists apply to the atom of living forms. Out of these simple forms of life all higher and more complex organisms are formed. This is true of animals as well as vegetables. Take a man in pieces, and he will be found to be made of similar masses connected together by various devices. Dissect a tree, and the same will be found to hold true. Examine a drop of blood with a microscope, and it will be seen that the blood is

simply a stream in which are floating, developing, moving, and working, millions of little creatures so nearly like the microscopic creatures found in the scum of a stagnant pool that they have received the same name. The arteries and veins of the body may be looked upon as corresponding to the rivers and streams of a continent, and the blood corpuscles to the fish which swim in the waters.

Effects of Heat

Q. **Does heat cause breaking down of the tissues?**

A. Experiments have shown that a rise of body temperature in man caused by external application of heat, and continued intermittently for several days, is not attended with an increased breaking down of protein, so long as the temperature does not rise much above 102° F. but that such increase appears when the body temperature reaches or exceeds 104° F.

Traveling for Health

Q. **Is it wise for an invalid to travel for health?**

A. Travel is often highly beneficial to the health of chronic invalids. The chief benefits of travel are not to be attributed to the change of air or scene, in the majority of cases, but rather to the change of habits necessarily involved in moving about from place to place in sight seeing, etc.

Many persons who at home take practically no exercise, in traveling, especially in mountainous regions, find themselves actually doing as much

muscular work as an ordinary laborer or mechanic in performing his daily tasks. This increased activity is of the greatest benefit through improving the digestion, bowel action, strengthening the heart, encouraging proper circulation of the blood, increasing the action of the lungs and blood purification by absorption of oxygen and general health promotion. Change of diet is also in many cases of great service, especially when one goes on a camping expedition. Heavy meals with many courses and rich desserts are necessarily exchanged for simpler bills of fare which gives the digestive organs a much needed rest.

In the majority of cases a correction of the daily habits of life, undertaken at home, will accomplish far more in a curative way than may be expected from the negative benefits derived from travel.

Bone Grafting

Q. **What is meant by bone grafting?**

A. In recent years, as a result of numerous experiments upon animals as well as human beings, a method has developed which has proven to be the most successful of all means of restoring injured bones to a normal condition. If, for example, a portion of a thigh bone is so damaged that the ends of the bone cannot be brought together so as to secure a solid union, a portion of the fibula or a strip of bone removed from the tibia may be used to fill in the gap. A slender piece of bone thus implanted is found to grow and develop until it becomes large enough to meet the needs of its new situation. This fact

affords a very striking illustration of the marvelous intelligence everywhere displayed in the functions and activities of the human body.

Fattening the Face

Q. **What harmless "cream" may be used to fatten the face?**

A. The face cannot be fattened by rubbing in "cream" of any sort. A diet which causes a gain in weight will produce increased fullness of the face. Massage of the face will encourage the deposit of fat in the cheeks by bringing more blood to the parts. As a lubricant for the skin of the face or "face cream" there is nothing better than lanolin cream. (See index.)

Centipede Bite

Q. **Is the bite of the centipede poisonous?**

A. The house centipede known in this country is more or less poisonous but fortunately its bite is never fatal. Although possessed of a most voracious carnivorous appetite the centipede probably never attacks human beings unless brought into immediate contact with the body and obliged to defend itself. The centipede feeds on house flies, cockroaches, and bed bugs, and so is somewhat useful as a destroyer of household pests. It lives in bath rooms, moist closets, cellars and pantries where roaches and flies are likely to be found.

The bite of the centipede is generally relieved by the prompt application of ammonia.

Mineral Elements of Plants

Q. **In what foods are iron, potash and phosphates found in greatest abundance?**

A. Metallic iron, phosphorus, and potash in the form in which these elements are known in the laboratory are not found in foodstuffs. In foods these substances are incorporated in the living structure in organic combination with other elements needed for nutrition. The amount of the elements named found in organized form in various foodstuffs differs, however, very considerably. For example, iron is most abundant in the green leaves of plants. Lettuce, spinach and tomatoes are particularly rich in this element. Potash is most abundant in green vegetables, particularly roots and underground stems, such as the potato, the artichoke, turnips, carrots, parsnips and sweet potatoes. Phosphorus is found in large proportions in cereals, particularly whole-grain preparations such as wheat, rye, barley, oatmeal, and unpolished rice.

Rigor Mortis

Q. **What is rigor mortis?**

A. The peculiar rigidity which comes soon after death in man and animals is supposed to be due to coagulation of the muscular fibre. It is the beginning of decomposition, and indicates the death of the muscular fibres. It is observed that in persons who die suddenly in a state of comparative health, as from accident, rigor mortis does not appear for some hours after death, and then remains for some time. In persons who die from long-continued or wasting disease, the opposite in both particulars is true.

House Pets

Q. **Are house pets objectionable?**

A. All house pets are more or less dangerous. Dogs are a constant source of danger. Cats are perhaps the most dangerous of all domestic animals. In a paper read before the National Conference of Charities and Corrections held at Richmond, these facts were emphasized, and the assertion was made that it requires more care to keep a cat or a dog in a safe and sanitary condition than to care for a child. Cats suffer from nearly all diseases to which human beings are subject. They are especially subject to diphtheria and ringworm. An entire community became infected with diphtheria from a single cat. The speaker mentioned a case which had come within his own personal knowledge in which several families were infected with ringworm from a handsome pet cat.

Twins

Q. **What is the cause of twins?**

A. There are two varieties of twins. First, those in which the twins do not look alike, and second, those in which they are identical in sex and closely resemble one another in all particulars. Twins of the first sort are due to the simultaneous fertilization of two distinct ova or embryos, each of which develops independently. Identical twins are developed from a single embryo. Early in its history the developing embryo splits in two and the two halves then develop independently into two identical human beings.

Smoke

Q. **Is smoke injurious to health?**

A. The smoke nuisance has come to be one of the most glaring evils of city life, especially in industrial communities. Recent experiments indicate that the enormous financial loss which occurs through the contamination of the atmosphere with smoke is but a very small part of the injury produced. Coal smoke contains among other poisonous substances sulphuric acid gas. This gas is poisonous to all living things. Its toxic properties are well shown by its poisonous effects produced upon plants. Very sensitive plants, such as fir trees, are injured by one part of sulphurous acid gas in one million parts of air. The curious fact was noted that the injury to plants by sulphurous acid is much greater during daylight than during night; it is also greater in spring than in winter. Sulphurous acid interferes with the process of assimilation in the plant. The pine tree, in fact all cone bearing trees, are found to be highly sensitive to the influence of smoke poisons. It cannot be doubted that similar injuries are inflicted upon the sensitive organism of young children and even older persons who are constantly subjected to the influence of a smoke laden atmosphere.

Body Consumption in Starvation

Q. **What portions of the body are first attacked when food is withdrawn?**

A. The calorimeter studies of the human body as well as of dogs, rabbits and other animals, show that in starvation the body first con-

sumes its store of glycogen or carbohydrates. Even this, however, is not entirely used up, although at the end of three days only a small fraction of the normal store of glycogen which amounts to about four per cent of the weight of the body is found remaining. The fats are absorbed only after the carbohydrates have been consumed. The protein or albuminous tissues are attacked simultaneously and in increasing amount as the fat is consumed. First of all in fasting such portions of protein as have not been assimilated but are, so to speak, afloat in the body are burned. Then the carbohydrates are attacked and lastly the fats. Protein is necessarily burned first for the reason that there is no provision made in the body for storing protein while carbohydrates are stored as glycogen, any surplus being converted into fat and stored as adipose tissue.

In fasting the stools are highly putrid and "similar in appearance to the feces passed when the diet is mainly composed of meat." (Von Noorden).

Says the same author, "The blood atrophies."

Statkewitsch studied the effects of fasting in a large number of animals—cats, dogs, rabbits, pigeons, frogs, lizards, and other animals—and found that after prolonged fasting the cells of the heart, liver, muscles, kidneys, pancreas, and other glands were the seat of degenerative processes. These processes were most marked in the muscles and glands.

Zander found evidences of degeneration of the heart muscles in pigeons after fasting eight to twelve days.

Gaglio found cloudy swelling of the muscles, granular and fatty degeneration of the liver in fasting frogs.

Body Loss During Long Fasting

Fatty tissues	95	per cent
Muscles	40-45	" "
Heart	40-45	" "
Glands	40-45	" "
Blood	40-45	" "
Bones	10-15	" "

Reproduction of Body Cells

Q. **How are the cells of the body reproduced?**

A. Cells have a limited life. They are constantly dying. New cells must be formed from foodstuffs. They cannot be formed from the materials of dead cells. When a cell dies, its material is disintegrated and cast out of the body. It has normally no further utilization in the body.

This fact affords a strong hint that animal tissue cannot be the best source for nutrient material for the human body. Otherwise, why should not the body use the remnants of its own tissues when crippled by use? A further striking fact also appears: the tissues of animals must always contain a very considerable amount of material derived from dead cells. All the cells of animal flesh are dead. It is rather surprising indeed that any utilizable material can be obtained from flesh.

In the case of a machine, worn-out parts may be recast into new parts, but in the animal body this cannot be done. Worn parts are wholly discarded and new parts must be constructed out

of new material derived from the daily food, and in part, from stored material.

Suspended Animation

Q. **Are the reports of long suspended animation in animals confirmed by scientific investigation?**

A. It is well known that frogs and fishes may be preserved alive for months imbedded in blocks of ice or frozen mud, and when restored to activity by being slowly thawed out are apparently wholly uninjured by the long exposure to a low temperature. Recent experiments have shown that round worms may be so thoroughly dried that they are flat like strips of paper, and may be kept for months in this condition, yet when soaked in water the dried worms may be in a few moments restored to a perfectly healthy appearance and activity. The conclusion is that although most of the functions of life are suspended in these cases a small degree of vital activity still remain; in other words actual death does not occur.

Life in Detached Body Tissue

Q. **May the cells or tissues of the body continue to live and grow after separation from it?**

A. Dr. Carrel, has within the last few years succeeded in cultivating various tissues outside of the body. A fragment of the heart of a chicken planted in lymph in a few hours had attained a size five times that of the original fragment and continued to grow for months. The fragment of tissue continued to beat regularly in

the new medium. After a day or two it was noted that the beating would cease, but if the tissue were placed in a temperature a little above freezing for a day or two, when warmed up again the beating would recommence and continue for twenty-four hours or more. The resting in the cold was found to be necessary to allow the tissues to get rid of the fatigue poisons. In other experiments Dr. Carrel succeeded in replacing one kidney of a cat by a kidney from another cat. After a time the other kidney was also replaced so that the cat, although both kidneys had been removed was apparently in perfect health through the activity of the kidneys obtained from two other cats.

The experiment was not successful however, for it was found that after some months the transplanted kidneys underwent degeneration. Hope is entertained that sometime it may become possible to transplant important organs from one person to another.

Ozone

Q. **What is ozone and is it a very valuable remedy for consumption?**

A. Ozone is a very active form of oxygen. When inhaled even in very dilute form it is highly irritating. It has many times been tried in the treatment of consumption but has proved to be entirely useless.

Density of the Air

Q. **What is the difference in the amount of oxygen present in the air on a mountain top and at sea level?**

A. The density of air depends upon the weight of the overlying atmosphere. It varies slightly at different times of the year, and in different parts of the world, and with the amount of vapor which it contains.

The air becomes rapidly less dense, as one rises above the sea level. At an elevation of two and seven-tenths miles, the amount of oxygen contained in a given quantity of air will be proportionately lessened, one-half what it is at sea level. It is calculated that at a height of 100 miles the pressure is one one-millionth of that at the earth's surface. The boiling point which at sea level is 212° F., diminishes one degree for every 350 feet of elevation above sea level. At the top of Mount Shasta, water boils at about 170° F.

Oslerism

Q. **Is it true as stated by Dr. Osler that human efficiency is small after the age of 40, or that "the effective vitalizing, driving work of the world is done between the ages of 25 and 40"?**

A. This view is disputed. Dr. Dorland has shown that both these statements are erroneous. Here are a few of the things which the Doctor tells us would be missed if the results of the work of men over forty years of age were to be blotted out of human experience:

"Printing from type, the discovery of dynamic electricity, of oxygen, of vaccination, of the circulation of the blood; the invention of the reflecting telescope, of the Bessemer process of making steel, of the double-acting steam en-

gine, of railways, and all the inventions and discoveries and advances in chemistry, medicine, manufactures, and commerce which have naturally followed these epoch-making achievements. History would have to be rewritten, for the names of Washington, Lincoln, Grant, Sherman, Kossuth, Tallyrand, Peel, Cavour, Nelson, Cromwell, Richelieu, Luther, John Knox, Palmerston, Bismark, von Moltke, Garibaldi, Columbus, and a host of others would have been forgotten in the absence of their most notable deeds."

Determining Age by X-ray

Q. **Can the age be determined by means of the X-ray?**

A. Yes; Dr. Rotch of Harvard University has demonstrated that the age may be determined by the X-ray which reveals the stage to which ossification has advanced as shown in the accompanying cuts.

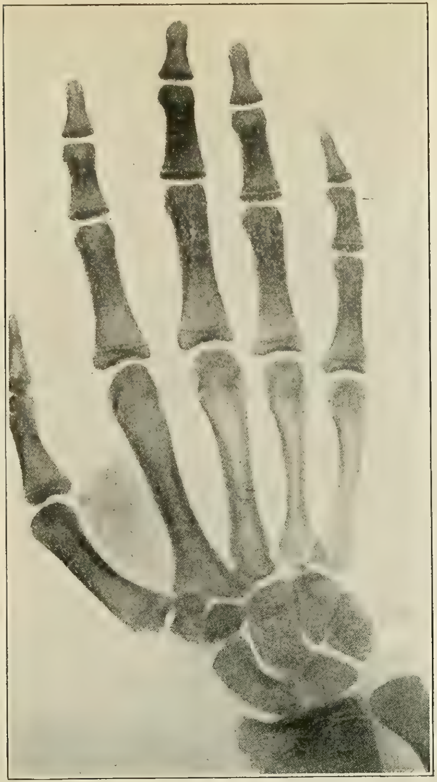
Paraffin Oil for Wounds

Q. **Is liquid petrolatum, or paraffin oil, useful as a dressing for wounds?**

A. Yes. According to Dr. Junkin, paraffin oil is an excellent dressing for wounds.

"In wounds of the extremities the sterile dressings are soaked in the oil and then applied to the parts. Any pus cavities forming in such wounds are washed out by means of a syringe filled with the liquid petrolatum."

The advantages of paraffin oil as an antiseptic are summarized by Dr. Junkin as follows:



Hand of a boy thirteen years and six months of age, showing bones much longer, the pisiform bone being as long as the cuneiform bone. The arrow points to the cuneiform bone. The reproduction is about five-sixths actual size.

Hand of a girl six years and nine months of age, in which seven of the carpal bones are present and the epiphysis of the radius, also the beginning of the epiphysis of the ulna. The bones have begun to mass together.

X-Ray of Hands

Hand of a girl six months old, showing cartilaginous wrist, with no epiphysis and with only two wrist bones.

Hand of a girl two years and nine months of age, in which three of the carpal bones and the epiphysis of the radius have appeared. The epiphysis of the metacarpal bones and of the first phalanges show very plainly.

X-RAY OF HANDS

"Oily substances tend to encapsulate the bacteria, thus destroying the infection.

"Great comfort is afforded by the oil dressings because of the non-irritating quality of the oil and its prevention of the dressings adhering to the wound.

"Owing to the low specific gravity of the oil it is especially effective in reaching the many recesses of an infected area.

"Some twenty-five cases of infection have been treated with the oil, no other antiseptic being employed. The results are all very striking."

Infected Wound

Q. **What is the best treatment for an infected wound?**

A. A freshly infected wound should never be closed up. The only safety is in keeping the wound open and keeping up active drainage. Painting the wound with tincture of iodine, or with a solution of iodine consisting of one part of tincture of iodine and three parts of alcohol, will destroy most of the germs which lie upon the surface. If some time must elapse before the wound can be dressed, the parts should be immersed in a salt solution prepared by adding two ounces of salt to a gallon of boiled water. The effect of the salt solution is to produce an outflow of serum and blood cells from the wound which will exercise the most salutary effect in preventing the growth of bacteria and in promoting a healing process. Badly infected wounds which cannot be closed should be kept continually immersed in a salt water bath. If the part injured is so located that immersing is incon-

venient, compresses of cheesecloth saturated with salt solution should be kept constantly applied to the parts. The compresses should be changed before they become dry.

Sick Room Disinfection

Q. **What is the best method of disinfecting a sick room?**

A. The sick room may be fumigated by the use of formalin.

In recent years less stress is laid upon the importance of fumigation by sanitary authorities. It is now believed that thorough ventilation of the sick room together with thorough scrubbing of the floors and walls with soap and water are practically the only measures necessary.

A room which has been long occupied by a person suffering from chronic disease, or by a fever patient, or a case of smallpox or other contagious disease, ought to be very thoroughly cleansed before being occupied by others. The means by which this may be most efficiently done are these:

1. Take out the windows, and give the greatest possible freedom to ventilation.

2. Remove the old paper from the walls, and burn it. Wash the bare walls with a solution of copperas, and then apply whitewash to the ceiling.

Cleanse the woodwork with a solution of chloride of lime, one pound to the gallon.

3. Remove the carpet from the floor, the bedding from the bed, and every other fabric from the room, and thoroughly disinfect them before replacing.

Osteopathy

Q. **Is osteopathy a scientific method?**

A. The name osteopathy justifies the inference that this medical system bases its curative efforts upon the supposition that disease is, in general, the result of some morbid condition of the bones or joints. The so-called "lesion" theory of osteopathy was at first based upon this notion, which was, however, quickly shown to be an error after the introduction of the X-ray as a means of diagnosis. At the present time there is a marked tendency among the practitioners of osteopathy to discard the exclusive bone lesion theory. The lesion idea has been extended to many other structures. The osteopathic philosophy seems to be rapidly expanding, and if it continues to develop at its present rate, will in a few years more become almost identical with what is now known as physiotherapy, which recognizes the curative value of all natural agents. Many persons are doubtless benefitted by the vigorous manipulations of the muscles and joints employed in the osteopathic method.

Radium

Q. **What is radium?**

A. Radium is a heavy metal derived from the rare metal uranium. It glows in the dark and throws off rays of various sorts which produce powerful effects upon all living things. The so-called "gamma" rays of radium are believed to be similar in nature to light rays, although invisible, moving with a velocity one thousand times greater. Radium also throws off minute

particles which have "an energy of more than six thousand million times that of the swiftest rifle bullet."

This rarest of metals is possessed of most extraordinary properties. Its activity is so great that it may be well that it exists in very small quantities. Sir William Ramsay estimates that the amount of radium in the whole world is not over 500 pounds. Fortunately it is widely scattered.

M. Currie, one of the discoverers of radium, declared that he would not be willing to venture into a room which contained a pound of radium.

Radium is useful as a means of curing cancer of the skin. It is capable of rendering service in other forms of disease. It must be used by an expert.

Mechanotherapy

Q. **What is mechanotherapy?**

A. Certain forms of passive exercise may be administered by machinery far more effectively than by the hand. This is particularly true of vibratory exercise. The rapid, steady, and prolonged vibratory movements which can be administered by machinery can not be even approximated in efficiency by the human hand. Certain kneading and percussion movements may be administered more effectively by mechanical means than by the manual method. Mechanical vibration, kneading and shaking movements, are the most effective forms of mechanotherapy.

Diathermy

Q. **What is diathermy?**

A. This is a new method of applying elec-

tricity in which the electrical current is converted into heat within the body. None of the ordinary effects of electricity are experienced; that is, there is no electrical sensation, no muscular contraction; the only sensation is that of warmth. By proper arrangement of the electrodes the heat may be concentrated in any part of the body. This invention renders it possible to apply heat to internal parts heretofore inaccessible.

This method has been found of very great advantage as a means of stimulating the activity of the liver, kidneys and other internal glands when inactive. It has also proved of great service in cases of dilatation of the heart. A dilated heart has been seen by means of the X-ray to contract under its influence. It is of great service in cases of arteriosclerosis, especially in cases in which the disease affects the vessels of the abdomen, the most common form of arterial degeneration.

Diathermy is highly useful in neuralgia of all forms, in migraine and other forms of headache; also in sciatica, neuritis and muscular rheumatism. It absorbs gouty deposits by raising the temperature of the blood and so rendering the uric acid deposits soluble. It is altogether one of the most useful additions which have been made to physiotherapy in recent years.

The Electrocardiograph

Q. **What is the electrocardiograph?**

A. This is one of the most remarkable and interesting instruments for diagnosis which has appeared in recent times. Its value is based upon the fact that the heart in its action gives

rise to electrical currents. By means of the electrocardiograph these delicate currents may be recorded in such a manner as to produce curves the form of which indicates whether the heart is in a condition of health or not, and if it is diseased, the nature and location of the disorder. There are certain obscure heart troubles the nature of which can be determined only by means of the electrocardiograph.

The Salt Glow

Q. **What is the value of the salt glow?**

A. The salt glow is an admirable means of producing circulatory reaction without thermic reaction if the temperature employed is not very much below that of the surface of the body. The salt acts as a chemical irritant to the skin, in addition to the mechanical stimulus produced by the rubbing of the sharp crystals in contact with the surface of the body.

The salt glow produces to an intense degree the circulatory stimulation of the brine bath, the sea-water bath, the effervescing bath, and the saline sponge. By moistening the salt with ice-cold water, it is possible, however, when desirable, to produce most powerful thermic effects in addition to the circulatory reaction produced by the chemical effect of the salt and the friction.

It is also a tonic measure of high value, and also produces valuable derivative effects; it is especially valuable in feeble patients whose heat-making powers are small, and in whom thermic reaction does not readily occur, or, if it does, the cold bath exhausts the patient and produces loss of heat. The salt glow is valuable in cases in

which the skin is very inactive, a condition commonly found present in chronic indigestion. It may be usefully employed in cases of Bright's disease and in diabetes, conditions demanding increase of skin activity, but contraindicating the cold bath.

Massage

Q. **Does massage increase metabolism?**

A. According to Zuntz the belief that massage stimulates metabolism has no real scientific foundation. Breathing is not materially increased as a result of massage and the consumption of oxygen is not increased more than ten or fifteen per cent which is no more than would result from slight finger movements. It is evident then that massage, either manual or mechanical, can have very little effect in breaking down tissue in obesity.

High Frequency Current

Q. **What is the high frequency current and is it a useful method of treatment?**

A. The so-called high frequency electrical current is an alternating current similiar to that which is used in the so-called wireless electricity. It has been employed in the treatment of certain morbid growths with a measure of success.

This method employs electrical currents which were first discovered by Tesla but were first used in application to the human body by d'Arsonval. Properly applied, this current produces powerful effects in relieving pain, lowering blood-pressure, and in favorably influencing the various vital functions.

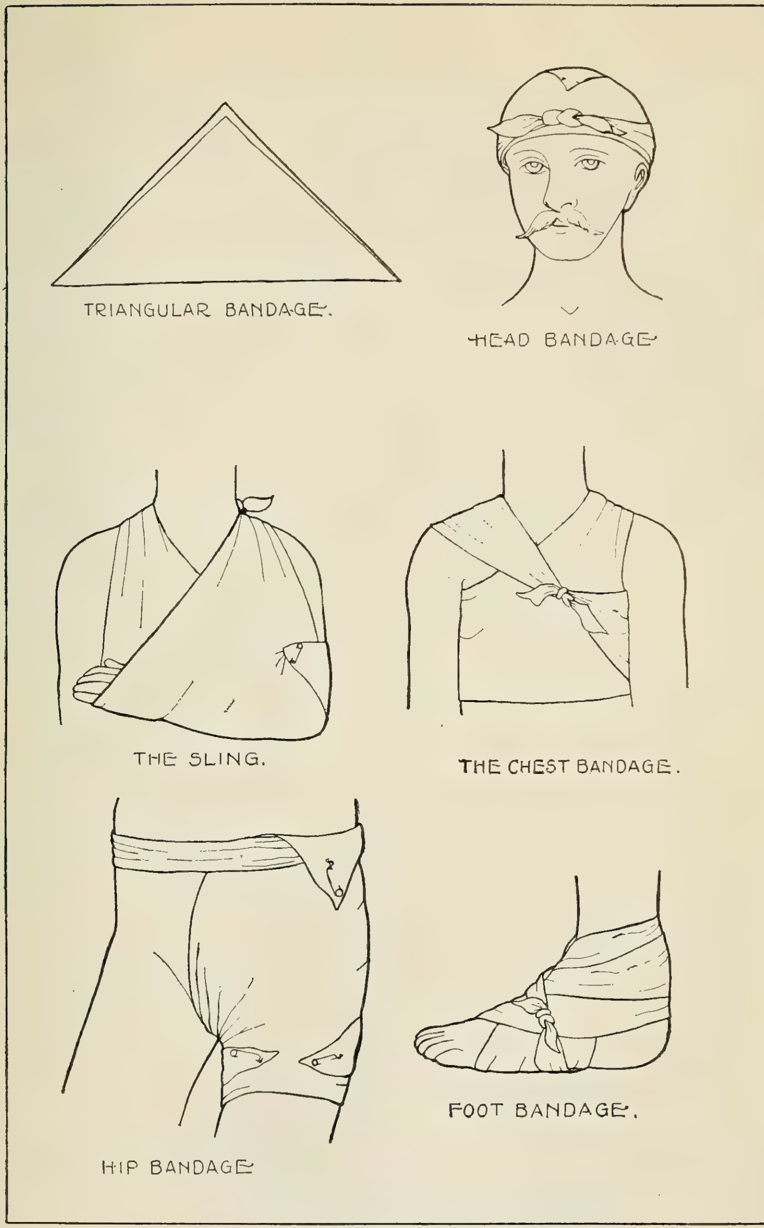
Phototherapy

Q. **What is meant by phototherapy?**

A. The wonderful influence of the sunlight as a curative agent has been appreciated from the most ancient times. The Greeks and Romans provided most excellent arrangements for "insolation" or sun bathing in connection with their great public baths as well as in the palaces of the rich. Sick animals show preference for the sun.

The discovery of the electric light, veritable resuscitated sunlight, has placed in our hands the means by which the powerful healing agent which permeates the body with its healing rays may be utilized at all seasons of the year. The arc light is called into service with special frequency in the cold months when the outdoor gymnasiums are not in use.

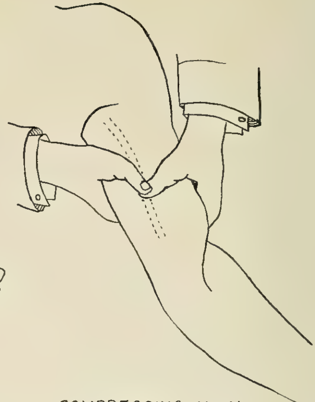
The electric light bath possesses all the virtues of the Turkish bath with none of its dangers and inconveniences, and adds the marvelous virtues of light. The luminous heat rays do not stop at the skin as does ordinary heat, but permeate the soft parts of the body in every direction, searching out painful and sluggish parts and imparting their powerful vital stimulus. Its value in the treatment of chronic maladies of all sorts can scarcely be over-estimated. Its superior efficiency as well as its luxurious attractiveness are well attested by the fact that it has been more extensively copied and imitated than any other invention of the sort. The electric light bath is without doubt the most important improvement in bath appliances that has been made in modern times.


TRIANGULAR BANDAGE.
HEAD BANDAGE
THE SLING.
THE CHEST BANDAGE.
HIP BANDAGE
FOOT BANDAGE.

First Aid

a COMPRESSING ARTERIES OF THE FINGER.

b COMPRESSING ARTERIES OF THE WRIST.



COMPRESSING MAIN ARTERY OF THE ARM

COMPRESSING THE ARTERY OF THE ARM IN THE NECK.

COMPRESSING THE MAIN ARTERY OF THE LEG.

First Aid

Family Medicine Chest

Q. **What can you suggest to take the place of the old-fashioned family medicine chest?**

A. It is important that every home should have a sort of first-aid outfit. The following is a list of first essentials:

Clinical or fever thermometer.

Bath thermometer.

Ice bag.

Hot water bags (one large, oval, one long bag).

Enema outfit.

Fomentation cloths.

Cheese cloth, mackintosh and flannel for compresses and packs.

Two Turkish towels.

Roll of adhesive plaster.

Sterilized absorbent cotton.

Sterilized gauze, one package.

Three or more rolls of bandages (varying width).

Medicine dropper.

Atomizer.

A package each of bicarbonate of soda and boracic acid.

A bottle of some bland sweet oil.

Tube of vaseline.

Two white enamelware bowls.

Camphor ice.

Castile soap.

A good pair of scissors.

Hand and nail brushes.

Other useful articles may be included, but with this as a beginning one is fairly equipped for ordinary emergencies.

Hot Baths

Q. **What is meant by a hot bath? How hot should it be?**

A. By the term "hot bath" we usually mean an ordinary full bath given at a temperature of 98° to 104° F. The bath should last from two to three minutes. It must never be very greatly prolonged, because baths above the body temperature cause a rapid accumulation of heat and a rise of temperature. In the administration of the bath at a temperature considerably above that of the body, the beginning temperature should be 100° F., the temperature being gradually raised, by the addition of hot water, to the maximum desired. By this means the skin becomes gradually accustomed to the elevated temperature, and a much higher temperature will be tolerated than if the patient enters the bath at the maximum temperature.

Care should be taken that the water is not too hot. To prevent this one should have at hand a bath thermometer. Where this is not obtainable do not rely upon placing the hand in the water as a test, for the hand becomes, by usage, so obtuse to heat that water which would seem only warm to it would be painfully hot to the body of the patient. To avoid this source of error, it is only necessary to plunge the arm to the elbow into the water, by which means the real temperature will be determined. Water which causes redness of the skin is hot; when it feels simply comfortable, with no special sensation of either heat or cold, it is warm. Slightly cooler than this is tepid. When it causes the

appearance of goose-flesh, it may for practical purposes be called cool, a still lower degree being cold.

Bath Temperatures

Q. **What temperatures are indicated by the terms cold, hot, tepid, etc.?**

A. The following table gives the temperatures indicated by the various terms in common use:

Very cold	32° to 55° F.
Cold	55° to 65° F.
Cool	65° to 80° F.
Tepid	80° to 92° F.
Warm (neutral, 92° to 95°)	92° to 98° F.
Hot	98° to 104° F.
Very hot	104° and above

The Daily Bath

Q. **Is the daily bath essential to health?**

A. For sedentary people, yes. Persons who live active lives, especially wild tribes which live in the state of nature and wear little clothing do not need the benefits of the daily bath.

The daily cold bath and frequent warm baths compensate to some degree for the lack of exercise and out-of-door life. The daily bath is not prevalent among the laboring classes, yet the active out-of-door life led by persons of these classes gives them greater longevity than the so-called better class, notwithstanding their dirty skins.

Bath Rules

Q. **What are the best bathing rules?**

A. 1. A cold bath should never be taken when one is tired or exhausted.

2. Applications toward which there is an in-

stinctive dread should, in general, be avoided. The bodily instincts generally crave things that are good for the body, and repel things likely to do harm.

3. General cold applications should never be made when the skin is cold, when a sensation of chilliness is present, when the hands and feet are cold, or when the head is hot. In such cases the skin must be warmed by a warm bath, such as the electric light bath, or the hands and feet should be heated by placing in water, and the head cooled by the application of a towel wrung out of cold water (not ice-water). The cold bath must also be avoided when the body is much fatigued or overheated. In such a case, a very short hot bath should be taken, followed by a neutral bath (92° to 96° F.)

Cold Air Bath

Q. **Will a cold air bath serve the same purpose as a cold water bath?**

A. For some persons the cold air bath is preferable to the cold water bath, as it leaves the skin dry. The reaction produced is ordinarily less than from cold water, but the effect may be increased by prolonging the application and accompanying the air bath by vigorous rubbing of the skin with a towel or with the hands, or both.

The duration of the bath must depend upon the temperature of the air, the susceptibility of the patient, and the degree of activity accompanying the air bath. Most persons may readily become accustomed to exposures of from five to ten minutes. Vigorous muscular activity should

be maintained during the exposure, and the whole surface of the body should be vigorously rubbed, so as to promote reaction. The appearance of slight chilliness is an indication that the bath should be terminated at once. A very good plan is to take the air bath immediately on rising in the morning. If one sleeps in a cold room, as he should do, on getting out of bed in the morning the covers should be replaced so as to retain the warmth of the bed. It is a good plan after the bath to return to bed for a few moments before dressing, so as to encourage complete reaction. The bath in this way may be repeated two or three times in succession. This is a good plan for those who are not accustomed to the air bath, and who cannot endure exposure to the cold air more than two minutes at a time.

One of the most agreeable forms of the cold bath is the swimming bath when this is available. A very good substitute is the "exercise bath," an imitation bath in the surf which is taken in a bath tub by means of a simple appliance. (See page 590.)

Cold Water Shampoo

Q. **Does frequent washing of the head in cold water tend to cause baldness?**

A. No, the very opposite.

Hydrotherapy

Q. **What is hydrotherapy?**

A. Hydrotherapy is the rational or scientific use of water. It differs from the old fashioned "water cure," still in vogue at mineral spring

resorts and many similar places, in that the methods employed are based upon a careful study of the physiologic effects of the several procedures, so that their value and effects are known with certainty. "Water cure" methods have done an untold amount of good, but they have also done harm, and should now be displaced by the more exact and hence safer methods of hydrotherapy.

There are three distinct classes of procedures in hydrotherapy which may be simply termed (1) the douche method, (2) the immersion method and (3) the wet cloth method; to which may be added the combined method.

The douche method comprises the various forms of jets, showers, "pours," etc., in which water *in motion* is employed.

The immersion method comprises all sorts of procedures in which the body or a part of it is immersed in water. The "wet-cloth" method (an awkward but appropriate name) comprises all sorts of packs, compresses, fomentations, and frictions in which wet or moistened cloths are employed.

As commonly employed, scientific hydrotherapy is associated with various applications of light and heat, massage, exercise and other kindred measures.

When scientifically applied, water is unquestionably the most potent of all agents for combating disease. Water has been in use by the human race as a remedy from prehistoric times. It is employed by the most primitive tribes. It is even used by animals who seem to be led by instinct to resort for relief to this wonderful

agent which comes nearer than any other to being a veritable universal panacea.

Morning Cold Bath

Q. **Which is better to take after a bath—a cold mitten friction or an alcohol rub, or may one use both to good advantage?**

A. A warm bath should always be followed by some cooling measure, such as a cold pail pour, a cold mitten friction, a cold towel friction, or an alcohol rub, depending upon the strength of the patient. For a person in ordinary health, of fairly robust constitution, the cold full immersion bath may be advantageously employed as a measure of hygienic routine. If the cold immersion bath is employed, fill the tub sufficiently full of water to allow complete and instantaneous immersion of the entire body except the head. Immerse as quickly as possible after cooling the head. The duration of the bath must be very brief, not more than five to ten seconds. Rub the surface of the body vigorously while in the bath, and after emerging rub with coarse towels until the body is warm and dry. Exercise till reaction is complete, as evidenced by a sensation of warmth and well-being. The best time for the bath is immediately on rising in the morning, while warm and feeling a relish for the contact of cold water. Used thus the cold bath is a powerful means of promoting vital resistance and maintaining the integrity of the body. If this measure seems too severe, a cold towel rub may be employed. The cold mitten friction is still less vigorous.

Cold Mitten Friction

Q. **What is a cold mitten friction, and how is it given?**

A. The surface is rubbed with a hand covered by a mitt made of a fabric having a firm, close texture somewhat resembling haircloth, such as is used by the Turkish bath shampooers at Cairo and Constantinople. The hand covered with this mitt is dipped in water at 60° to 40° F. every few seconds while the surface is being rubbed. Each separate part, as an arm, a leg, the chest, the abdomen, the back, is rubbed until red, then dried before proceeding to another part.

The Heating Compress

Q. **How is the "heating compress" given?**

A. Wring a cloth out of cold water and apply to the affected part. Cover with mackintosh and then with several thicknesses of flannel. The moist cloth will quickly become warm, and will retain the heat for a long time. It acts as a poultice, and is fully as effective as a poultice (besides being much cleaner) in deep-seated spinal pains, in pains due to indigestion, chronic catarrh of the bowels, and constipation. A heating compress applied to the abdomen will often relieve congestion of the head and so induce sleep.

The Ice Bag

Q. **When should the ice bag or ice compress be used?**

A. The ice bag is so useful that it should be found in every home. It should be filled with

ice broken into small bits, preferably not larger than a lima bean. It should be filled about two-thirds full so that it will easily adapt itself to the parts to which it is applied.

Here are some of the most important uses of the ice bag:

Placed upon the throat or at the pit of the stomach it relieves vomiting. An ice bag back of the neck is an excellent remedy for sea sickness. In a case of acute inflammation, either internally or externally, one or two ice bags may be applied. Heat should be applied to the feet and legs to prevent chilling. An acute attack of appendicitis may often be avoided by an application of a couple of ice bags to the lower right side of the abdomen and over the appendix. The ice bags should be removed every hour and a hot fomentation should be applied to the feet and legs continuously. In pneumonia two or three ice bags should be applied over the affected lung during the first day or two. Every thirty minutes the ice bag should be removed for forty-five minutes. A good plan is to make a short hot application in the interval. An ice bag applied over the heart is an excellent heart tonic.

When the pulse is weak and rapid one or two ice bags applied over the heart will generally slow and strengthen the pulse. Care must be taken to avoid chilling by applying heat or extra wraps to the rest of the body.

Several ice bags or an ice cap should be applied to the head in cases of cerebral congestion. Ice bags may be applied to the neck in such cases with excellent effect.

The Fomentation

Q. What is a fomentation and how should it be applied?

A. A fomentation is a moist hot application. It may be applied in various ways. The important points are (1) to make the application as hot as can be borne without burning the skin; (2) to make the application cover a large area, the larger the surface the more effective; (3) not to continue too long (15 to 20 minutes is usually the right time, to be renewed after an hour or more if necessary, and (4) to make a short cooling application at the end.

The simplest method of application is by means of a flannel cloth wrung out of very hot water. It is well to apply a dry flannel cloth next the skin and cover all to retain the heat.

A flannel cloth previously wet may be heated by wrapping around a hot steam pipe or by laying on the top of a stove, protected by a newspaper, or by means of a special electric heater.

When continuous heat is desired, this may be secured by means of an electric thermophore placed over a moist cloth laid on the skin. A photophore may be used for heating, or in emergency a hot water bag or a sand bag may be employed.

Heat kills pain. This fact explains the chief value of the fomentation. It is an efficient means of employing heat. About the only precautions necessary are to avoid fomentations over the heart for more than one or two minutes duration, and to be careful not to blister the skin when the patient is paralyzed or unconscious.

Duration of Hot Application

Q. **For how long may a fomentaton be continued without injury?**

A. The duration of a fomentation is not usually more than five to fifteen minutes. When continued longer than five minutes, the flannel should be reheated. Small fomentations may be kept hot by means of one or two rubber bags filled with hot water, or a heated brick or jug or bottle. A rubber bag filled with hot water and covered with a moist flannel is a convenient method of applying a small fomentation. A rubber or a flexible metal coil through which a current of hot water is constantly passed may be used for a continuous application of moist heat by placing under a coil a moist flannel.

Even when pain is persistent, it is better not to continue the fomentation for more than fifteen to twenty minutes without exchanging it for a short cold application which may be made by dipping the hand in cold water and rubbing the parts, or by applying a towel or a cheesecloth napkin wrung out of cold water, for fifteen to twenty seconds. The cold application serves to restore the tone of the vessels, which is lost by prolonged application of heat, thus maintaining a more active circulation through the parts than can be secured by the fomentation alone.

A fomentation should never be allowed to remain on a part until it becomes cool, as this will produce an effect the very opposite of that desired.

Fomentations—Reaction After

Q. **How may reaction after a fomentation be best secured?**

A. At the conclusion of the fomentation, immediately after the withdrawal of the last hot cloth, a very short cold application should be made, either by rubbing the parts with the hands dipped in cold water or by applying for fifteen or twenty seconds a towel wrung out of cold water. By this means the blood is fixed in the skin so that the effect of the fomentation is prolonged.

If the fomentation has been so large or so long continued as to produce general perspiration, some general cold application should be made after the fomentation as a means of toning the skin. A cold mitten friction, a cold towel rub, and in some cases a cold wet sheet rub may be properly used for this purpose. As a general rule, such a cold application as the half bath, cold shower and the cold douche in all forms cannot be safely used in cases of internal inflammation, or when the patient is suffering with or has just been relieved from severe neuralgic pain.

Precautions Necessary in Use of Fomentations

Q. **Is there any danger in giving hot fomentations?**

A. Great care must be taken to avoid injury to the skin in the application of fomentations to paralyzed parts; also in applying fomentations to persons who are unconscious from shock, faint-

ing, or other cause, as during unconsciousness the circulation of the blood is often greatly slowed so that burns may be easily made at a temperature which would not injuriously affect a person in a normal condition.

How the Fomentation Relieves Pain

Q. **In what way does the fomentation act?**

A. The most important service rendered by the fomentation is perhaps in the relief of pain. Aside from opiates, there is no means by which pain may be so promptly and positively relieved as by the application of moist heat. For this purpose the fomentation should be applied as hot as possible without running the risk of injuring the skin. The fomentation acts both by the diversion of blood from the painful part and through a sedative influence upon the nerves. The area covered by the fomentation must be very much larger than that affected by the pain, at least three or four times as large.

Taking Cold After Cold Bath

Q. **Why does one take cold after a cold bath?**

A. One does not take cold after a cold bath because the bath is cold, but in spite of this fact. Daily cold bathing is one of the best precautions a person can take against colds. If, after taking a cold bath or a bath of any kind, one is not careful to thoroughly dry the skin, chill is apt to occur by the evaporation of moisture from the skin after dressing, and thus cold may be taken. Neglect to secure good reaction, that is thorough warming of the skin, after a cold bath

may produce a wretched feeling which may lead one to think he has contracted a cold when he has not, the symptoms being rheumatic in character. Very cold bathing especially in persons not accustomed to cold baths, may produce excessive reaction, which may often be accompanied by a slight fever, and so may be mistaken for a cold. After taking a cold bath a person should rub the surface of the body very thoroughly, and then take a walk or engage in some vigorous out-of-door exercise. Persons who are not accustomed to cold bathing should begin very cautiously, employing first the method known as partial bathing in which a small part of the body, as an arm or a leg, is first bathed then rubbed until warm.

Sun Bath

Q. **What is the curative value of the sun bath?**

A. Sunlight is one of the most powerful of all hygienic and curative agents. As a hygienic measure it is of inestimable value in the destruction of dangerous microbes, the most of which are unable to resist the action of the direct rays of the sun for more than a few minutes. Sunlight is thus the most important of all disinfecting and sterilizing agencies. The value of sunlight in the maintenance of health is well shown in the dwarfed development and rapid deterioration of plants deprived of its stimulating influence.

In taking a sun bath, either the whole or a part of the body may be exposed to the direct influence of the solar rays, or some protection

may be afforded by a covering of white cheese-cloth. The bath may be best taken in a room properly constructed for the purpose. The room should face the south, and the windows should be sloping. The patient should lie on a cot placed before a window, the head being protected from the direct rays of the sun. The length of the exposure will depend upon the intensity of the sun's rays and the effects sought. If the light is very intense, or the patient very feeble, the duration of the bath should not be more than five minutes if the whole body is exposed; in less sensitive patients, or those accustomed to the sun bath, it may be continued from twenty minutes to half or three quarters of an hour.

Indications for Sun Bath

Q. In what conditions should the sun bath be used?

A. The sun bath is useful in all cases of malnutrition, anemia, inactivity of the skin, chronic dyspepsia, most cases of neurasthenia, indigestion, chlorosis, rheumatism, diabetes, and obesity. The only class of cases in which the bath is positively contraindicated is that in which the patient has recently suffered from heat stroke, and is especially susceptible to the action of the direct rays of the sun; but such cases are rare.

Sunlight a Healing Agent

Q. In what way does sunlight cure disease?

A. Sunlight is the greatest of all promoters of health and the greatest enemy of disease. The direct sunlight will kill disease germs in a few minutes. Even the deadly tuberculosis

germs succumb to the bright rays of the sun in ten or fifteen minutes. Thus every tuberculous patient should live in the sunlight as much as possible. When the sunshine can be made to fall directly upon the diseased tissues, the greatest results are attainable. The sunlight not only kills the consumption germ, but at the same time vitalizes and energizes the body and increases its fighting power.

Dr. Finsen, of Copenhagen, was one of the first to demonstrate the curative value of sunlight in tuberculosis, and persons suffering from tuberculosis of the skin flocked to his clinic from all parts of Europe. When in Copenhagen many years ago, the writer visited the famous "Light Institute" founded by Finsen and found the place thronged with patients and a continuous procession of sufferers filing along the streets in the vicinity.

Recent experience has shown that tuberculosis of the larynx, once regarded as a hopeless disease, may be cured by the application of sunlight direct to the diseased surfaces by means of a suitable arrangement of mirrors. The patient sits in the sunlight with the body uncovered to the hips. The back is turned toward the sun and a concave mirror throws the concentrated rays into the open mouth, where it is directed into the larynx by means of a mirror set at the proper angle and held in place by the patient, who may become very expert in making the application after a little instruction.

Warm Bath for a Cold

Q. Should a warm bath be taken for a cold?

A. Immediately after a cold is taken, a very hot bath is often very useful; but for relief of a chronic cold, warm baths are less useful than cold baths.

People with a tendency to take cold may "harden" themselves by cold baths.

Are Daily Baths Weakening

Q. Is the daily bath "weakening"?

A. Hot baths are weakening or depressing, but short, cold baths are tonic and strengthening. Very short and very hot baths have a tonic effect also, while long cold baths are very depressing. Cold bathing may easily be overdone by those not trained and "hardened" to the use of cold water.

In cold weather, a cold air bath is in many cases to be recommended instead of a cold water bath.

In this kind of bath the body should be exposed to the air for three or four minutes, the skin being vigorously rubbed in the meantime with the hands or with a towel or flesh brush. A reaction produced in this way is in every way as useful as that produced by the application of cold water, and involves no risk of taking cold or chapping of the skin which some persons find a great inconvenience in cold weather.

The Hot Bath After Exercise

Q. **Should a cold or a hot bath be taken after exercise?**

A. In a case of complete exhaustion after violent exercise, a short hot bath is preferable to a cold bath. In fact, a cold bath is generally dangerous in such cases, because of the loss of the power of the body to react. In these cases the nerve centers are so exhausted that good reaction to cold can not be induced. A very short and very hot application to the skin produces tonic and stimulant effects similar to those produced by cold. After a short hot bath a very cold application may be made without danger.

The Brand Bath

Q. **What is the "Brand bath" and for what is it used?**

A. This is a cold rubbing bath used by German physicians in the treatment of typhoid fever.

The bath tub containing water at a temperature of 70° to 80° F. is placed near the bed. The patient is lifted from the bed into the tub as quickly as possible, the face and head having been previously cooled by the application of water at 50° F. Care should be taken to immerse the patient to the neck, as exposure of the shoulders is likely to give rise to pulmonary complications. The head should be protected by a towel wet in ice water and wrapped about the head in such a way as to form a sort of trough leading down the back of the head. On entering the tub the patient is rubbed vigorously for two or three minutes then sits up for a few seconds while two or three gallons of water at 50° F. are poured upon his head and allowed to run down the back of his neck. He then lies down again and the rubbing

is repeated. At the end of five minutes the affusion to the head is repeated and the rubbing continued. After the bath the patient is covered well in bed.

Salt Water Baths

Q. **Is the use of salt in a bath as a flesh reducer harmless?**

A. Yes, entirely so because the salt is not absorbed by the body. So long as the temperature of the water is higher than that of the body, the movement is outward. There is no absorption. When the temperature of the bath is lower than that of the body in a cool bath, there is some absorption taking place. In the ordinary warm bath with salt water, the salt is practically not absorbed at all.

The Neutral Bath

Q. **What is the correct temperature of the warm bath to cure insomnia?**

A. The neutral bath temperature is from 92° to 98° F.

Hot Foot-Bath

Q. **How should the foot-bath be taken?**

A. The water should be as hot as can be borne. Use 105° to 115° F. The temperature of the water can be gradually raised. The deeper the water the greater the effect. The leg-bath is still more efficient than the foot-bath, but not always so convenient as the hot foot-bath, which may be taken in bed. If necessary, a fomentation may be applied to the feet, but the effect is not so good as that of the hot foot-bath. It is an excellent means of relieving severe pain in the head, also ovarian and menstrual pains.

The Exercise or Rowing Bath

Q. **What is the best substitute for sea bathing?**

A. Swimming in the open air is without doubt one of the best of all forms of exercise. Unfortunately this form of exercise is at the present time inaccessible to the majority of people though it is hoped that the time will come when every public school will be supplied with a swimming pool so that every boy and every girl may learn to swim and may have an opportunity to engage in this wholesome exercise at all seasons of the year. A recent invention makes it possible for every home to have the essential advantages of sea bathing or swimming by the aid of a simple appliance which may be connected with any bath tub. The following is a brief description of the "exercise bath:"

The patient sits in a bath tub filled with water, and dips water over himself while at the same time executing the movements of rowing. The temperature of the water may be 100° F. at the start, but should be rapidly lowered by opening the cold water faucet and, if necessary, letting out part of the water while the cold water is running in. The rowing and dipping apparatus consists of a pair of handles to which is attached a dipper and a rubber cord. The bather fills the bowl as he reaches forward, then dashes the water over his body as he pulls the bowl towards his chest and bends his body back. Strokes are made at the rate of about thirty per minute. From one hundred to one hundred and fifty strokes are made. The temperature of the water

grows continually colder to the close of the bath or until pipe temperature is reached. A temperature of 70° F. to 65° F. is easily borne, and one finishes the bath with the same delightful sensation of warmth and glow which one feels after a swim in the surf. The temperature of the water is, of course, under perfect control, an advantage over sea bathing and the work done may be made as vigorous as one desires.

This exercise bath is most excellent for persons suffering from constipation. The impact of the cold water upon the surface of the abdomen reflexly stimulates intestinal activity.

The exercise bath is especially valuable in cases of obesity. Both the exercise and the cold water help to burn up the excessive accumulation of fat in the abdominal wall and within the abdomen.

Effervescent Bath

Q. **What is an effervescent bath?**

A. The so-called effervescent bath or Nauheim bath is a mineral bath in which carbon dioxide is produced in sufficient quantities to keep the water of the bath saturated.

The most convenient method of giving the bath is to dissolve in the water of the bath a mixture of common salt, chlorid of calcium and bicarbonate of soda, then to place along the length of the tub at the bottom little blocks of fused bisulphate of soda. The bisulphate is slowly dissolved and so gives rise to the gradual formation of CO_2 and maintains a saturate solution of the gas for a considerable period. The following proportions have been found to be suitable:

Sodium chlorid	40%
Calcium chlorid	25%
Sodium bicarbonate	17.5%
Sodium bisulphate	17.5%

A mixture of the first three ingredients weighing 110 ounces, and ten blocks of bisulphate of soda weighing 2⅓ ounces each are required for an immersion bath of forty gallons.

Sitz Baths in Pregnancy

Q. **At what temperature should sitz baths be taken during pregnancy, and what should be the duration of the bath?**

A. 80° to 90° F.; eight to twelve minutes. The parts immersed should be continuously rubbed to prevent chilling.

The Hot Sitz Bath

Q. **In what conditions is the hot sitz bath useful?**

A. A short very hot sitz bath (112° to 120° F.) is a most excellent means of relieving chronic pelvic pain. The duration should be from three to five minutes, and it should be instantly followed by a dash of cold water upon the hips, or rapid cold friction of the parts. This is a most excellent and serviceable analgesic measure, and may be advantageously employed in chronic ovarian and uterine pains, painful affections of the rectum, and chronic inflammation of the prostate.

Revulsive Bath

Q. **What is meant by the "revulsive sitz bath"?**

A. With the feet in hot water, the patient sits in water at a temperature of 102° F. and the temperature is gradually raised to 110°, 112°, or even 115° F. or as hot as can be borne. The skin should be well rubbed. After four or five minutes, the patient rises, and cold water is dashed over him. If cold water induces pain, the temperature should be lowered gradually. In this case the patient remains from five to ten minutes longer in the bath, the moist surface being rubbed. This prevents chilling after the bath, and increases the permanency of the effect produced.

The Continuous Bath

Q. **Are prolonged baths dangerous?**

A. The prolonged or continuous tepid bath is a most valuable remedy. It is absolutely harmless. The lives of many persons suffering from extensive burns have been saved by the continuous bath.

This bath is now employed in all the leading insane asylums as a substitute for drugs and is used for putting patients to sleep. A stay in the bath from two to ten hours will cure the most desperate case of insomnia.

Dr. W. Weygandt, an eminent German physician recently reported his experience with the effect of water treatments in cases of mental and nervous diseases. The continuous tepid bath has not only a tranquilizing action, he says, but it aids in the healing of skin affections. In the thousands of cases in which he has applied it he has rarely noted any bad effects. He asserts that in his experience the continuous tepid or

neutral bath produced particularly beneficial effects on the metabolism, and that several of his patients have improved to such an extent that they could return to business, while in numerous other cases it has prolonged life for years.

He found the continuous bath an important aid for neurasthenics; the effect is more dependable than mere bed rest, as he found by personal experience during a nervous breakdown from overwork.

The continuous bath must be maintained at a temperature varying little from 96° F. At this temperature, no reaction occurs and the nervous system is not excited. At the same time, the nerve ends of the skin are rendered less sensitive by imbibing water, while the nerves are tranquilized and soothed.

More particular, however, the bath produces a decidedly stimulating effect. The absorption of water by the skin is sufficiently active to excite great activity of the kidneys. Very large quantities of urine are often produced, and by this means the blood and tissue fluids are cleared of depressing or irritating poisons.

Precautions Necessary in Taking Cold Baths

Q. **What precautions are necessary in taking a cold bath?**

A. Four points are especially to be borne in mind in taking the cold bath:

1. The body must be all over warm before any kind of cold bath. For this reason the best time for taking the bath is immediately upon rising, while the body is warm. If not warm

the body should be warmed by taking a *very short* hot bath before the cold one. A cold bath to a cold body is dangerous.

2. The room in which the cold water bath is taken must be warm.

3. The body must be all over warm at the conclusion of the bath.

4. A cold bath must be of short duration—the colder the water the shorter the bath. Prompt and thorough reaction after a cold bath must always be the rule.

The Abdominal Bandage

Q. **What is an abdominal bandage and how should it be applied?**

A. There are several forms of the abdominal bandage. A dry bandage worn about the abdomen is a useful means of support to the abdominal organs in cases where the muscles are weak. A simple bandage of flannel is generally used for this purpose. The moist abdominal bandage is useful in nearly all forms of indigestion affecting the stomach and bowels. This application consists essentially of a towel wrung out of cold water as dry as possible, wrapped around the body and covered with dry flannel. The covering should be thoroughly done, so that no portion of the moist bandage should be exposed. The covering should be thick enough to secure a quick warming of the towel, and to keep it warm. Both bandages should be applied snugly.

Vibration

Q. **What is the value of vibratory treatment?**

A. Vibration causes first contraction and then dilatation of the blood vessels.

Strong vibration of the chest wall causes expansion of the lung,—an effect of very great importance, as there is perhaps no other means by which the same results can be so quickly and efficiently obtained. The effects of vibratory applications to the chest wall are quickly manifest by the long and deep respiratory movements which continue for some time after the conclusion of the application.

Vibration applied over the precordial region lessens the rate of pulsation and increases the force of the heart's action to a very remarkable degree. Zander observed a fall of from 130 to 90 pulsations per minute. This effect of vibration is so well recognized among French physicians that vibration is sometimes referred to as the gymnastic digitalis.

Zander and others have shown that mechanical vibration produces contraction of smooth muscles. That strong vibratory applications will increase peristalsis the writer has frequently shown in cases in which visible peristalis was produced in patients having thin abdominal walls. This effect has also been clearly demonstrated in the effect of vibration in relieving constipation. This is one of its most pronounced and certain effects, whether the application is made by the vibration chair, or by a hand vibrator applied over the abdomen and back.

The drowsiness and even sleep which follow the application of vibration to the head clearly demonstrate the sedative effect of centrifugal vibration upon the brain applied in this manner. The first sensation is that of slight giddiness, differing, however, from that which is produced by a whirling motion in not being accompanied by nausea. A similar but less pronounced effect is produced when the application is made to the occiput or back of the neck. The application is followed by a sensation of lightness and increased mental activity.

The Enema

Q. **Should the enema be administered warm or cold?**

A. Warm enemas are necessary in cases of colic or colitis and when the bowels are sensitive.

The cold water enema is an efficient means of reducing temperature which is highly useful in connection with other measures, especially when patients have a great repugnance to cold applications to the skin. Two or three pints of water should be used at a temperature of 80° to 70° F. A lower temperature is likely to produce tenesmus and too quick discharge of the water. The water should be injected slowly and retained for ten to fifteen minutes, if possible. When discharged, a like quantity should be introduced, this procedure being repeated until the temperature is reduced a degree or two, or until the patient shivers. A hot bag at the pit of the stomach prevents uncomfortable chilling.

In certain cases the fever seems to yield more readily to the cool enema than to any other

means, although in general this is a less reliable measure for reducing temperature than the cooling pack or the cool bath.

The enema is indispensable as a means of mechanically emptying the bowels under various conditions. It is useful as a means of temporary relief in many cases of constipation, and the graduated enema is a useful means of treatment. When used habitually, the temperature of the water should be lower than that of the body, preferably not higher than 80° F. and sometimes lower.

The enema is also highly valuable as a means of supplying water when for any reason it cannot be gotten in by the mouth. A half pint of water every hour, to be retained will supply the much needed water in these special cases.

The enema is less useful as a means of introducing food. Malt sugar is about the only food which can be utilized in this way. An ounce of malt sugar may be added to each pint of water introduced.

The Cooling Wet Sheet Pack

Q. **How should a cooling wet sheet pack be given to a child?**

A. To administer the cooling wet sheet pack, arrange upon the bed a rubber or oil-cloth sheet to keep the mattress from becoming wet; or if neither of these be available, a Turkish sheet doubled for the child to lie upon will serve well. Spread a single blanket over this across the bed so that at one side it may be brought up to cover the patient. A cotton sheet as long as the child and large enough to wrap once around him,

wrung out of cool water (70° F.) is next spread over the blanket and the child, divested of its clothing, is laid upon it and completely enveloped in the wet sheet over the chest, under the arms, and between the legs, coming in contact with every portion of the skin surface, and then covered with the single thickness of blanket.

The sheet is left until it becomes warm, which may be five to eight minutes. As soon as the sheet is warmed it is replaced by one freshly wrung out of the cool water, and this again by another, as soon as it approaches the temperature of the skin. This process is continued until the sheet is no longer quickly warmed, or until the temperature has been lowered as indicated by slight shivering. The length of time required to warm the sheet will increase with each fresh one applied.

In very obstinate cases it is sometimes needful to continue the procedure for an hour or two, but generally five or six changes will be sufficient to lower the temperature one or two degrees, and the patient should be permitted to rest for a time, during which his temperature is carefully watched. Should it again begin to rise, and a physician is not at hand, it will be better to resort again to the pack than to allow the fever to get the upper hand.

It sometimes occurs with a restless child that he resists being wrapped all over with the wet sheet. In such cases allow him to keep one arm out but cover it with the blanket that covers the whole body. It is important to remember that the pack *must* be kept carefully covered by the

blanket which should be folded snugly about the patient's neck to prevent the contact of air, thus chilling the patient.

KEEP THE FEET WARM.

Care must be taken that the little one's feet are warm, before beginning the pack. With children under two years a bottle of hot water should be kept at the feet. Should the child not react promptly upon being wrapped in the wet sheet, a brisk rubbing of the surface over the sheet—but always underneath the blanket—will counteract the difficulty. It is often wise to give the feet and limbs a gentle rubbing for a minute or two at the beginning of the treatment.

Harm is likely to result if the wet sheet is long left in contact with the skin after it has become well warmed, as superheating may thus occur, and the fever increased. It will probably take from six to eight minutes for the first wet sheet to become warm, ten or twelve for the second one, fifteen minutes for the third, twenty for the fourth and a still longer time for the fifth, this indicating that the temperature is lowering.

A point to be borne in mind in this connection is always to keep the wet pack well covered with the wool blanket, not even for a moment leaving it uncovered, and making the changes with all possible deftness and speed.

The Chest Pack

Q. **How is the chest pack applied?**

A. As follows: Wring dry as possible out of cold water two large linen or cotton towels. Apply one across each shoulder, bringing the ends across the chest before and behind. Wind snugly about the chest and over the shoulders a wide flannel bandage, taking great care to exclude the air. A bandage of mackintosh may be applied under the flannel to prevent drying of the compress when this is desired.

Rational Medicine

Q. **What is meant by the term "rational medicine"?**

A. The term "rational medicine" is no longer new. It is already a trite phrase, and physicians are daily coming more and more into sympathy with those rational and physiological means which, while often slower as regards immediate results, act with a certainty and permanency that cannot be ascribed to those agents which, if active at all, are only active as toxic agents.

Rational medicine seeks not to cure disease by a system of antidoting one poison by another, or by neutralizing the effects of one morbid action by artificially creating another of an opposite kind. Liebig, the German physician and chemist who achieved so many triumphs in the cause of scientific medicine in the first half of the last century, once remarked respecting the treatment of disease by medicinal agents or drugs, "We do but cure one disease by pro-

ducing another." It is true that not infrequently the drug disease is of a less inconvenient nature than the disease for which it is substituted; nevertheless, the principle still stands, and is one well worth considering; indeed, a vast number of intelligent medical men have become thoroughly tired of the dull routine of medicating maladies, and are seeking in more thoroughgoing measures the permanent relief which comes from tissue regeneration and functional renovation of a disordered organism.

Rational medicine seeks first to find and remove the cause of disease and then to aid the body in its efforts to combat disease by means of all natural and rational remedies, such as light, water, air, heat, exercise, diet, and other physiological measures.

Remedies for Pain

Q. **What are the best means of relieving pain?**

Hot-water bag. A rubber bag filled with hot water is an excellent means of relieving pain in deep-seated parts, pain of the back, chronic intestinal pain, various neuralgias, and other pains in which inflammation or congestion is not present. Hot bags should not be employed continuously on persons suffering from acute inflammation.

If a moist application is desired, a moist flannel may be wrapped around the water bag. Bricks, sand bags, etc., may be used in a similar way.

Radiant Heat. Consists of the application of a lighted electric lamp surrounded by a suitable

shade or reflector to the part affected. It is a most excellent means of relieving pain. The heat is more penetrating than that from any other source except the arc light and sunlight. It is a capital means of relieving pain of the spine, various joint pains, and all kind of neuralgic pains.

Flame Heat. The heat rays which radiate from a blazing fireplace may be utilized for relieving a chronic pain in the back or side and non-inflammatory pain involving any large portion of the body. Lie on a sofa or rug before the fire with the skin exposed.

Arc Light. A most effective means of relieving visceral and spinal pains. The heat must be concentrated by means of a reflector of proper shape.

Sunlight. Sick animals nearly always lie down in the sun, unless suffering from inflammation. There is no better remedy for general neuralgic pains than a sun bath.

Hot Air. A current of heat driven into the ear is a most effective means of relieving earache. A general hot-air bath removes rheumatic pains.

Alternate Compress. The alternate application of hot and cold compresses is an effective means of relieving pain from internal congestion. The application is made over the painful part and affords relief by diverting the blood to the surface.

Alternate Sponging. The application and effect are the same as for the alternate compress. Very much hotter water can be employed however, and when the parts may be rubbed with ice

in alternation with the hot application, most powerful revulsion may be induced.

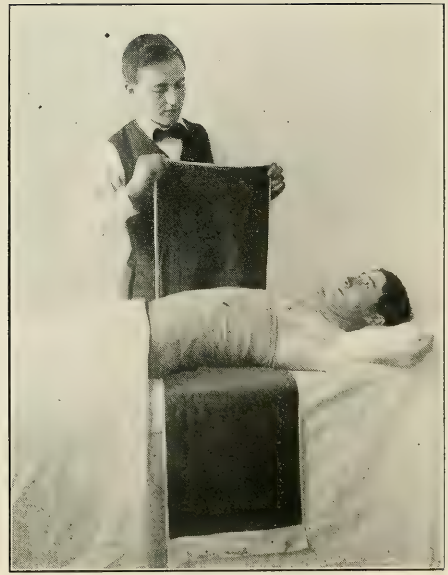
Cold Rubbing. This is an excellent means of relieving certain forms of pain. Neuralgic pains may be aggravated by this means, but pains due to congestion are usually relieved. The parts must simply be rubbed with a cloth dipped in cold water. The temperature of the water should not be lower than 60° F. It is often necessary to continue rubbing for a long time until the surface is thoroughly reddened.

The Ice-Bag or Ice Compress. Patients with inflammation or congestion are best relieved by the application of a small ice compress or an ice bag over the painful part. Generally it is well to apply heat to some distant part in connection with the ice application or to make a general hot application so as to prevent chilling.

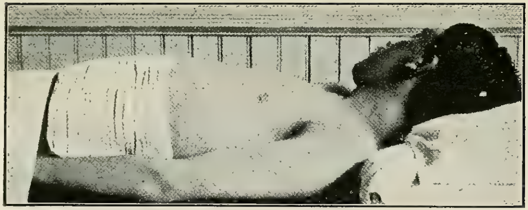
Heating Compress. Wring a cloth out of cold water and apply over the painful parts. Cover with mackintosh and then with several thicknesses of flannel. The moist cloth will quickly become warm, and will retain the heat for a long time. It acts as a poultice, and is fully as effective as a poultice (besides being much cleaner) in deep-seated spinal pains, as found in pains due to indigestion, chronic catarrh of the bowels and constipation. A heating compress applied to the abdomen will often relieve congestion of the head in headache, and so induce sleep.

Fomentations followed by the Heating Compress. This is a most effective means of relieving pain in chronic rheumatism. The heating compress should usually follow the fomentation, and

Fomentation to Abdomen



Wet Girdle



Abdominal Compress

Heating Compress

Cold Compress over the Heart

Head Compress Covered by Mackintosh Cap

is invaluable as a means of removing sciatic pains, lumbago, and most other deep-seated pains due to nerve trouble. It is excellent in neuritis.

Cotton Poultice. This is similar to the heating compress. The parts are covered with cotton, covered with mackintosh, then with flannel. The heat induces perspiration, which accumulates in the cotton and moistens it so that after a time the application really becomes a moist compress. Its effects are the same as a poultice, but more cleanly and effective.

The Clay Poultice. Modelers' clay mixed with equal parts of water and glycerine to the consistency of very thick cream, and applied hot to the painful parts, often affords relief. This is a most excellent application, far better than bread and milk poultices or any similar preparation. Under the name of "Antiphlogistin," a clay paste is sold in many drug stores. Our experience is that this preparation is no better than ordinary clay prepared as suggested.

In making the application, the clay is spread over the affected parts, and covered with cotton. It must be warmed before using. Warming softens and facilitates the application, and at the same time the heat itself helps the effect.

General Hot Bath. Severe internal pain is best relieved by a general hot bath, which, drawing the blood to the surface, often affords complete relief in severe pains due to gall-stones, gastritis, arthritis, and other painful affections.

The Hot Blanket Pack. This is similar to the hot-water bath, but is not so effective. It can sometimes be more conveniently employed. It

is useful in relieving the pain of menstruation and of appendicitis. The whole body is wrapped in a blanket wrung out of hot water.

The Foot-Bath. The water should be as hot as can be borne. Use 105° to 120° F. The temperature of the water can be gradually raised. The deeper the water, the greater the effect. The leg-bath is still more efficient than the foot-bath, but cannot be taken in bed. If necessary, a fomentation may be applied to the feet, but the effect is not so good as that of the hot foot-bath. It is an excellent means of relieving severe pain in the head, also ovarian and menstrual pains.

Revulsive Sitz. With the feet in hot water, the patient sits in water at a temperature of 102° F., and the temperature is gradually raised to 110°, 115° or even 118° F., or as hot as can be borne. The skin should be well rubbed. After four or five minutes, the patient stands, and cold water is dashed over him. If cold water induces pain, the temperature is gradually lowered. In this case the patient remains from five to ten minutes longer in the bath, the moist surface being rubbed. This prevents chilling after the bath, and increases the permanency of the effect produced.

The Hot Hip and Leg Pack with the Ice-Bag. This is especially useful for relief of pain due to pelvic inflammation in women, or appendicitis in either men or women. The hips and legs are wrapped in a blanket wrung out of hot water, and after the patient begins to feel warm, an ice-bag is slipped under the blanket and over the affected part. This is a most excellent means

Giving the Baby a Hot Blanket Pack (No. 1)

Wringing the Blanket

A Blanket Pack (No. 2)

Tucking hot blanket snugly around the baby.

A Hot Blanket Pack (No. 3)

Dry blanket pinned snugly with hot water spine bag placed on either side and small hot water bag at feet.

A Hot Blanket Pack (No. 4)

A woolen blanket covering all.

of combating appendicitis. By the renewal of this application for two or three hours, an attack of appendicitis may be sometimes checked.

Ice-Bag and Fomentation. For toothache, lay an ice-bag on the side of the neck under the jaw and fomentations to the side of the face. If necessary, employ the hot foot-bath and the hot hip and leg pack. Also consult a dentist.

Hot Enema. The temperature of the water should be from 102° to 106° F. A copious enema will relieve severe intestinal pain in a marvelous way,—the pain of gall-stones, renal colic, appendicitis, inflammation of the bladder, and neuralgia.

Rest. Absolute rest of the painful parts is usually necessary. Rest in bed is required for the relief of severe internal pain. In pleurisy, rest of the affected lung should be secured by fastening a tight bandage around the lower part of the chest.

Position. Pain in the limbs accompanied by throbbing may generally be relieved by raising the limb one or two feet from the bed or couch upon which the patient is lying. Rest is always required when pain is present.

Pain in the Chest

Q. **What is the remedy for a smarting pain in the left side of the chest?**

A. A hot fomentation over the stomach and the seat of pain, hot sponging of the same parts, followed by the heating compress, are means likely to give relief. The heating compress is applied as follows: A cloth is wrung out of cold water dry enough so it will not drip;

this is laid over the affected parts and covered with oiled muslin or some other impervious cloth, and the whole is protected by means of heavy woolen wrappings. It is quite possible that the pain may be due to intestinal autointoxication resulting from constipation. A laxative diet is to be recommended in such cases. Use bran and paraffin.

The Thirst Cure

Q. **Is there any advantage to be gained by the thirst cure?**

A. It has been claimed that by withholding water the body will be compelled to burn up its waste matters more actively. But carefully conducted experiments carried out by Solomon on two subjects showed most conclusively that the amount of oxygen consumed by persons undergoing the thirst cure is not at all increased, which is sufficient proof that there is no increase of oxidation and hence no advantage to be gained from this standpoint.

In certain cases of dropsy, accompanying advanced disease of the heart, it is sometimes necessary to temporarily limit the intake of fluids so as to lessen the volume of the blood.

Source of Animal Heat

Q. **What is the source of animal heat?**

A. It was formerly supposed that heat was generated by a special mechanism under the control of the central nervous system. It is now known that this is an error. Heat is regarded as a by-product in the human body as it is in the operation of the steam engine. In case of

the human body, the heat, though a waste product, serves a useful and necessary purpose except, of course, when it is produced in greater excess than is necessary to maintain the temperature of the body at 100° F. Under ordinary circumstances two-thirds of all the energy contained in the food reappears as animal heat. The other third is dissipated in external work performed by the muscles. For a given amount of work the same amount of energy is required whether the work is done in summer or in winter. In summer time the body generally diminishes somewhat in weight because the appetite fails on account of the depressing influence of heat so that the intake of energy becomes less than the output. The negro and other natives of tropical countries have in this respect an advantage over the white men, for they escape the depressing influence of heat, being able to eat as much in hot weather as in cold weather, and they are able to make good their energy expenditures and do not lose weight. Rubner attributes this advantage of the negro to the fact that he is a vegetarian, remarking: "The negro, however, is able in summer to take a full diet owing to the small amount of protein which he consumes," also "because he is wonderfully free from fat."

Stomach Warmer

Q. **Is the use of the stomach warmer beneficial in indigestion?**

A. The application of heat to the stomach is one of the oldest and, aside from diet, one of the best remedies for various gastric discomforts. A hundred years ago tin cans made con-

cave to fit the body were to be found in almost every tin shop, and their use was continued until the manufacture of rubber hot-water bags was begun some fifty or sixty years ago. The writer well remembers an old-fashioned schoolmaster from Canada who came under his care many years ago, bringing with him a huge stomach heater of the sort described.

Two hundred years before the invention of the tin stomach warmer, the warming stone was in common use, and was described in a medical work published in 1640 as "An Excellent Help really found out for cold, aged and sick People—and for the Poor, who may borrow the heating of this stone at a neighbor's fire, if his Charity be not altogether cold; for it will damnifie him no more than lighting one candle by another."

Persons who suffer from discomfort after eating are usually greatly relieved by application of a hot water bag over the stomach while lying down for half an hour or an hour after a meal. Hot sand bags answer the same purpose. When nausea or vomiting are present, the patient should take care to lie on the left side as this position subjects the stomach to less strain and often prevents vomiting.

Nature Heals

Q. **What is the process of cure?**

A. Said Dietl, pupil of the famous German pathologist, Rokitanski: "Nature alone can cure; this is the highest law of practical medicine, and the one to which we must adhere. . . Nature creates and maintains; she must therefore be able to cure."

The healing power is in the blood; it is the blood that heals, or rather, the creative power which formed the body in the first place, and which repairs the damage done by the wear and tear of life. It is this same power which restores disordered functions and repairs damaged tissue. Physicians do not and cannot heal.

Medicines, baths, and other so-called remedial measures are powerless to heal. All that physicians and remedies can do is to aid in removing causes of disease and supplying favorable conditions. Physiological measures, such as water, electricity, massage, exercise, and sunlight, regulation of diet and clothing, possess a wonderful controlling influence over the healing power of the body by regulating the movement of the blood, the greatest of all remedial agencies; and by stimulating the vital activities and controlling the vital forces by which the healing process is carried on.

Tonics

Q. **Are medicinal tonics of use for toning up the nervous system?**

A. Medicinal tonics are of no use in building up the nervous system. The body can only be built up by means of proper foods. Drugs produce good feeling without actually improving existing conditions. The best tonics are good food, fresh air, proper exercise and cold bathing. Outdoor sleeping has an excellent tonic effect. The morning cool bath has no superior as a tonic. When cold water cannot be tolerated or cannot be conveniently obtained for the

morning bath, the cold air bath may be substituted.

Obesity

Q. **When may a person be regarded as obese?**

A. There are, of course, degrees of obesity. A person whose weight is ten or fifteen per cent greater than that of the average person of his height may be said to be over-fat. When the excess of fat amounts to twenty-five per cent of the normal weight of the individual he may be said to be obese. Cases are sometimes met in which the fat accumulation is so great that the person's weight has become more than double the normal. Such a person is dangerously obese.

Any person whose weight is fifteen or twenty pounds more than the normal weight for his height should take measures to reduce his weight.

The Cause of Obesity

Q. **What is the cause of obesity?**

A. There are several causes.

The most common cause is over eating or eating an excess of fats. An excessive intake of starchy foods also tends to produce an excessive accumulation of flesh. The same is true of sugar. Candy eating is undoubtedly a frequent cause of excessive fat accumulation. Food is fuel; fat is unused fuel.

About one-fourth of the food we eat is consumed in muscle work, the remaining three-fourths is mostly used in maintaining the heat of the body. It is evident then, that the amount of

food consumed should be regulated by the temperature and amount of work done. A person lying quietly in a warm bed requires less than half the amount of food which is needed by a person exposed to cold and engaged in active exercise. A man working very hard out doors in very cold weather might in fact utilize fully three times as much food as a person lying still in bed or sitting quietly in a warm room. It is evident then, that the amount of intake should be carefully regulated to the output in heat and work. Obese people are generally persons who have a good appetite and good digestion and on this account are likely to eat more than the body requires to maintain the normal body temperature of one hundred degrees and the necessary output of energy. When a person finds himself gaining in weight this fact is usually evidence that his intake of food fuel is greater than the consumption. This excess of intake will be deposited as reserve tissue or fat. It should be borne in mind also that it is not so much the quantity of food eaten, but the character of the food. One may for example, eat very liberally of such foodstuffs as juicy fruits, lettuce, celery, turnips, greens and other fresh vegetables without accumulating flesh. Indeed, on such a diet one may easily loose flesh, whereas if one eats freely of such concentrated foodstuffs as bread, cereals, sugar and fats one may easily eat an excess even though the quantity eaten has not been at any time sufficient to produce a sensation of fullness in the stomach. It is for this reason that starchy foods and fats are said to be fattening, whereas it would be quite impossible for

a person to become over-fat on a diet of fruits and vegetables, the Irish potato and sweet potato being excepted.

In recent years another form of obesity has been recognized which can scarcely be said to be due to over eating. This form of the disease has been shown to be due to a disturbance of the internal secretions. Persons who suffer from this form of obesity are often pale. They may be small eaters. The difficulty appears to be that the food is not utilized; that is, the food fuel is not burned as efficiently as it should be. The individual is like a furnace that has insufficient draft. The fuel not being properly burned accumulates and the furnace is choked.

This form of obesity is due to a disturbance of the pituitary gland. It is usually characterized by an uneven distribution of fat. The back of the neck, the hips, the abdomen and, in women, the mammary glands, are the most common seats of fat accumulation.

When this form of obesity occurs in early life there is an arrest of sexual development.

The proper remedy for this form of obesity is the extract of the pituitary gland. An up-to-date physician should be consulted.

Is Obesity Curable

Q. **Is obesity curable? If so, by what means?**

A. Practically all cases of obesity are curable if proper means are adopted. It must be understood, however, by a cure is not meant complete restoration to a normal condition. This is by no means always possible; in fact,

in cases of extreme obesity it is not safe even if it were possible to reduce the patient's weight to his original standard. If, for example, a person whose normal weight is 175 pounds has acquired a weight of 350 pounds he should be content to reduce his weight to 225 or 250 pounds. A reduction of weight of 150 or 175 pounds could scarcely be accomplished in such a case without doing the individual serious damage. A great accumulation of fat in the abdomen stretches the abdominal muscles so that when this condition has existed for a considerable length of time the removal of the fat will leave the abdominal muscles in such a relaxed condition that they will not afford proper support to the viscera. The fat which has been present in excess has been deposited all about the various internal organs, in some instances in masses an inch or more in thickness. When this padding is absorbed, a relaxed condition is developed which often gives rise to pain and miseries of various sorts, such as those which attend the condition known as floating kidney for example.

The treatment of chronic obesity is very simple in appearance, but not always easy in execution. The average obese patient is over-fat because he has eaten too much food and taken too little exercise, so the essential features of treatment are, first, a diminution of the amount of food, second, an increase of the amount of exercise. A decrease in food intake is by far the most important of all measures which can be adopted in the treatment of this disease. As obese patients generally have excellent appetites the re-

duction of food intake is often a matter of much distress and inconvenience especially if the dietary is unwisely managed. It is by no means necessary that the patient should fast or even that the amount eaten should be diminished. It is best that the full volume of food should be maintained or even that the food should be increased in volume, but instead of such concentrated foodstuffs as bread, potatoes, sugar and fats of various sorts the patient should restrict his dietary to fruits and vegetables with the exception of the potato. In many instances this is all the restriction required. The patient should abstain from the use of fat meats, butter, and other fats, cream and milk with the exception of skimmed milk, bread and other cereals and potatoes. Lettuce, celery, greens of all sorts, fresh vegetables and juicy fruits may be eaten freely. In this way the appetite is satisfied even though the actual amount of nutriment may be very greatly diminished. In general, it is necessary that the obese patient should diminish the amount of actual food substance eaten to one-half the amount he has been accustomed to take or two-thirds of the normal ration for a person of his height.

The so-called Karell method of treating obesity consists in feeding the patient exclusively on a diet of skimmed milk. The patient's diet is restricted to one pint of skimmed milk a day. The milk is given in doses of a few spoonfuls at intervals of two or three hours.

In certain cases surplus fat may be removed by a surgical operation.

Obesity Dangers

Q. **What are the dangers from obesity?**

A. Plump people are only one-fourth as likely to suffer from tuberculosis as a person of average weight, while lean people are six times as likely to suffer from this disease as those who are overweight. Dr. Symmonds has clearly shown that leanness predisposes to tuberculosis or at least to fatal tuberculosis, while lean persons are only half as likely to suffer from diabetes as persons of average weight.

Lean persons, on the other hand, are twice as likely to die from pneumonia as persons who are overweight. Fleshy persons seem to be in some way immune against the germ of pneumonia, while lean persons are especially susceptible. Overweights suffer twice as often from Bright's disease, both acute and chronic, as do persons of normal weight. This is probably due to the excessive feeding to which overweights are likely to be habituated. Obese persons suffer from cirrhosis of the liver three and one-half times as often as persons of normal weight.

Doctor Rogers, the chief medical director of a great New York life insurance company has shown by extended and careful study of the data furnished by the experience of this great insurance company, that persons who are even ten per cent above the normal weight have a considerably higher mortality than those who are ten per cent below the normal weight.

How to Reduce a Fat Abdomen

Q. **What will reduce a fat abdomen?**

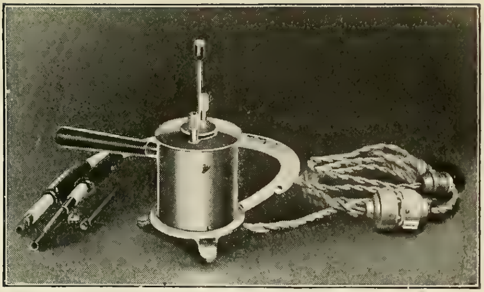
A. Sawing wood. This is a capital exercise, something that will make the abdominal muscles work. Or one may lie on the back and raise the legs to vertical 150 times a day. The next best thing is to lie on the back and raise the head far enough to see the feet for a considerable number of times daily. This will contract the abdominal muscles and make them work. This part of the body gets fat because the muscles are so little used. Work uses up fat as fuel. Fat accumulates where there is deficient activity; so the main thing to do is to make that part of the body work. Swimming is a good exercise for the purpose.

Automatic exercise, that is, exercise produced by rhythmical electrical stimulation of the muscles, is a most efficient means of reducing either general or local obesity.

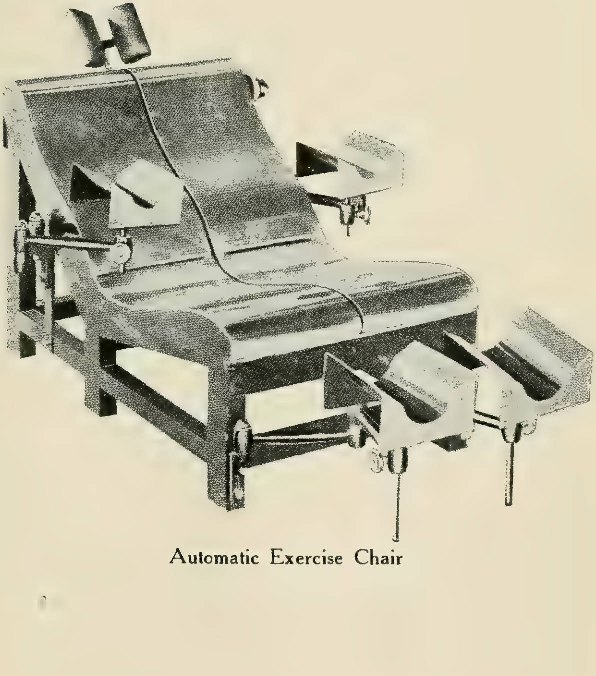
Buttermilk Cure for Obesity

Q. **What is the buttermilk and potato cure for obesity?**

A. In the so-called "buttermilk and potato cure" for obesity, the patient is allowed to eat nothing at all but buttermilk and potatoes. A full ration of these two articles would require a person to eat two quarts of buttermilk and seven pounds of potatoes. The bulk of this diet is so great that the patient finds it quite impossible to eat the whole of it. Consequently he is able to satisfy his appetite completely while at the same time the amount of food he takes



Electro-Thermo-Steam Inhaler



Automatic Exercise Chair

is less than his body requires, and the result is he loses in weight.

This diet has a further advantage in that it contains very little fat. The sense of satiety depends more upon the bulk of the food than the quality of it.

Fasting to Relieve Obesity

Q. **In fasting for relief of obesity, how much may the diet be reduced?**

A. In an attempt to get rid of surplus flesh by reducing the intake of food, it is highly important to avoid robbing the body of its store of protein as this must result in wasting of the muscles, weakening the heart, depreciating the blood and generally injuring the vital machinery. Carefully conducted experiments by Magnus-Levy, Beinstein, and others, have shown that if the dietary is not reduced much below two-thirds of the actual requirement, that is, not more than one-third below the energy output, the protein of the tissues will not be attacked while the fat will be progressively consumed. It is especially important also to note in arranging the dietary for a fat patient that the protein may be protected by making the diet consist almost exclusively of carbohydrates. That is, fats should be almost withdrawn from the diet. The protein intake may be kept at the minimum, and the carbohydrates should constitute the greater part of the ration.

The "Fruit Regimen" for Obesity

Q. **Is the "Fruit Regimen" good for obesity?**

A. There is no method superior to the fruit and bran regimen. This plan is very simple. The diet is made to consist exclusively of juicy fruits, bran, celery, lettuce, cucumbers, etc. The food should be taken four times a day or at intervals of about four hours. Convenient hours are seven a. m., eleven a. m., three p. m. and seven p. m. At each meal two or three heaping dessert spoonfuls of sterilized bran should be eaten. A very convenient way to take the bran is with stewed tomatoes or apple sauce, or it may be made into a porridge with tomatoes or fruit of some sort thickened with a small spoonful of flour or meal. Salt should be avoided altogether or taken only in a very minute quantity. This is quite important if a rapid reduction of weight is desired. One or two paraffin tablets or an ounce of paraffin oil should be taken at each meal. The purpose of this regimen is so secure very pronounced activity of the bowels which greatly aids in the reduction of flesh. After a week or two the number of bran and fruit meals may be reduced to three and the amount of nutriment may be increased by the addition of other vegetables, one or two small potatoes, a small slice of bread and butter at each meal, preferably in the form of zweiback and small portions of scalded oatmeal.

Care should be taken to avoid making the regimen so severe as to produce a sense of weakness and exhaustion. Two or three

quarts of water should be taken daily. Free water drinking helps to rid the body of tissue wastes.

In cases in which the tongue is coated as the result of intestinal toxemia, the "fruit regimen" not only reduces the weight but also changes the intestinal and alkalinizes the blood and tissue fluids. Constipation and intestinal toxemia with headache or rheumatism as natural consequences is frequent in obesity, the "fruit regimen" affords a highly useful means of dealing with disease.

Obesity Pills, Anti-Fat Remedies

Q. **Is it safe to make use of the much advertised anti-fat remedies for reducing the weight?**

A. Certainly not.

Many of these so-called obesity remedies are dangerous. Such nostrums do harm by causing delay in the application of efficient remedies. And besides, not a few of these obesity remedies contain active and highly dangerous drugs. One of the products most frequently employed is the dried thyroid of the sheep. This remedy may be of some value in rare cases in which there is a deficiency of the secretion of the thyroid gland, but even in these cases it must be used with the greatest care as an over-dose is likely to produce serious disturbances of the heart and various nervous disorders of a more or less serious character. In by far the great majority of cases of obesity there is no deficiency of the thyroid secretion and administration of thyroid is followed within a few days by quickening of the pulse and the

appearance of various unpleasant and more or less serious nervous disturbances and sooner or later grave conditions may be developed. Thousands of persons have been damaged by the use of these meretricious nostrums. The only safe thing is to avoid them altogether. One who suffers from obesity should place himself under the care of an intelligent physician and carefully follow his instructions. Diet and exercise are sovereign remedies for this condition.

Massage not an Efficient Remedy for Obesity

Q. **Can excessive fat be removed by means of massage?**

A. No. Massage is purely mechanical in its effects. It does not increase to any considerable extent the bodily activities by means of which alone fat can be consumed. Careful experiments made by Zuntz, an eminent German investigator, and others showed that massage does not increase metabolism and hence cannot be relied upon as a means of reducing fat. Many persons have wasted an enormous amount of time and money in an attempt to reduce their weight by treatment at the hands of manipulators who claim to be able to accomplish a cure. by massage and various special manipulations, but do not make good their claims. Work is necessary for the reduction of fat, and work by the patient himself, no matter how distasteful. The obese patient must make up his mind that he must work out his own salvation.

The Cause of Flatfoot

Q. **What is the cause of flatfoot?**

A. According to Dr. Fairweather, an English physician, the wearing of high heels is the chief cause of flatfoot.

"In a normal barefooted man the balance of the body is so perfect that practically no effort is required to keep erect. The weight rests on the heels and outer sides of the feet, not on the arch or inner sides of the feet. Fairweather says that if the heels are raised from the ground by boot heels even a quarter of an inch thicker than the soles, the outer side of the foot is removed from the ground and the weight falls on the arch. The center of gravity is also thrown forward, and in a man of 5 feet 7 inches the head is thrown 9 inches off the vertical by a heel three-quarters inch high. To remedy this, and to prevent falling forward, the back muscles and the extensors of the thigh and foot come into action. The peroneus longus and brevis, while extending the foot, also evert it, and the tibialis anticus, which supports the arch and inverts the foot, gets elongated and ceases to act. A soldier 5 feet 7 inches, weighing 154 pounds, and wearing a heel three-quarters of an inch thicker than the sole, has to exert strength enough to be constantly lifting 56 pounds from the ground in trying to retain his balance."

"Heels are also partly responsible for hammer toes, the long flexors of the toes being supplied by the same nerve as the calf muscles, and getting spastic with them. Fairweather thinks

sprained ankles, the stoop of old age, asthma, varicose veins, weak back, and spinal curvature may also be partly due to the effect of heels.

"A rational boot should have the soles and heels of the same thickness. Under the arch of the foot the sole should be curved with a convexity upward, but not so convex as to cause pressure on the sole. The leather could be reinforced by spring steel from the heel to the ball of the foot. The inner edge of the boot should be straight, so as to allow the big toe to be in line with the inner side of the arch, as in American boots."

Flat Foot

Q. **Is there any cure for flat foot?**

A. Yes, if the defect is taken in hand early enough. The deformity is due to weakness of the muscles and ligaments which support the arch of the foot. These may be strengthened by walking on tiptoe with the heels turned slightly outward.

The sole of the shoe should be made about a quarter of an inch thicker on the inside. This will slightly evert the foot and greatly aids in correcting the difficulty. This method has been shown by military experience to be better than the wearing of insoles.

Corns and Calluses

Q. **How may corns and callouses on the soles of the feet be cured?**

A. Corns, or calluses, on the soles of the feet are often very painful, and occasion great inconvenience. If very tender and swollen, with

redness of the tissues around about, the proper remedy is rest, lying in a horizontal position, accompanied by proper use of poultices, until the soreness and irritation disappear. After the tenderness has subsided, a loose shoe should be worn; and to relieve the corn of pressure, apply over it a thick piece of buckskin or felt, with an opening in the middle of the size of the callus. By this means, the pressure can be wholly taken off the callus, and nature will in due time effect a cure. If the skin is very thick, it may be softened by the application of compresses wet in a saturate solution of carbonate of soda. In a short time, the skin becomes softened, so it can be easily scraped off.

A still more efficient remedy is the application twice a day of a solution of salicylic acid in collodion, a dram to the ounce. Soak and dry each time before applying the collodion.

Care of the Feet in Winter

Q. **Give practical hints on care of feet in winter.**

A. Bathe the feet in cold water night and morning. Rub well and apply talcum powder. If the feet perspire, change the stockings every day.

Hot Feet

Q. **Is there any remedy for burning of the feet at night?**

A. The symptom is due to a vasomotor disturbance, the cause of which will generally be found to be chronic constipation or colitis. If

this symptom is troublesome at night it may often be relieved by placing at the feet a bag filled with cold water, also by applying to the feet an ointment consisting of cold cream with the addition of ten grains of menthol to the ounce. This should be rubbed on at bed time.

Keeping the Feet Warm

Q. **What is the best plan for keeping the feet warm in cold weather?**

A. The worst thing to do is to toast them over a register. Toasted feet lose the power to warm themselves.

The next worst thing to do is to wear rubbers or overshoes. The feet must have air to keep them dry. Feet moist with retained perspiration that should be carried off by evaporation through porous coverings will soon become cold. The reason is obvious. The non-conducting property of stocking and shoe is due to dryness. When they become wet or even moist, they are no longer non-conductors, but become good conductors of heat, and carry off the heat of the feet rapidly. The feet must be kept dry or they cannot be warm.

Clean stockings are necessary. Stockings which have been wet with perspiration are saturated with salt and other skin excretions, and so a dirty stocking is a cold stocking instead of a warm protection. The stockings should be changed at least every other day in real cold weather, especially when the feet are inclined to sweat.

The foot covering should be sufficiently reduced when one is indoors to prevent overheat-

ing of the feet and perspiration, which will lead to chilling after going out.

Our Canadian cousins are much given to out-of-doors sports, as we ought to be, and have learned some excellent means of warming the feet when cold.

"One of the methods employed in Canada consists in springing on the ball of the foot at each step. It is remarkable how soon feet which are numb with cold will warm up with this action. The warming effect in this case is obtained from the increased action of the muscles of the ankle and calf of the leg.

"Another method consists in kneeling on a semi-hard surface such as a sod, or a thinly cushioned bench, the whole weight of the body being taken directly on the knees. Along the edges of the frozen lakes and skating rinks in Canada one will see whole lines of people kneeling as if in prayer, with their skates still on their feet and chatting merrily as if this were a normal position in which to rest. When one inquires into the reason for this spectacle, he will be informed with surprise that the skaters are only warming their feet."

A Canadian takes off his rubbers to warm his feet, which is sensible, as it gives his feet a chance to become dry and hence warm.

Sweating Hands and Feet

Q. **What causes sweating hands and feet?**

A. Neurasthenics are much subject to perspiration of the hands and feet. The perspiring parts are usually cold. This condition is usually associated with constipation and is re-

lieved by the application of measures elsewhere recommended for relief of constipation and neurasthenia.

Chilblains

Q. **What is the best treatment for chilblains?**

A. The alternate hot and cold foot bath is an excellent remedy for chilblains. The hot water should be as hot as can be borne, and the cold water as cold as can be obtained. Allow the feet to remain half a minute in the hot water and fifteen seconds in the cold water. Alternate ten or twelve times. Apply this treatment twice daily.

Frost Bite

Q. **What is the treatment for frost bite?**

A. Extensive experience in the trenches during the European war showed that lack of cleanliness of the feet is an important predisposing cause of frost bite. Moisture and over-tight shoes are also contributing causes. In bad cases there has been found a fungus similar to the mold which sometimes grows on meat and bread.

Washing the feet with borated camphorated soap and keeping them warm and dry are necessary aids to recovery. Electric heating pads have been used in the trenches with success.

The alternate hot and cold foot bath recommended for chilblains is of great service in restoring the vitality of the injured tissues.

The mold referred to abounds in straw and stable litter and hence dairymen and those who work in stables should take care to wash their feet several times a week with the disinfecting

soap above mentioned or some similar preparation.

Cold Feet

Q. **What is the cause of cold feet?**

A. When the feet and legs are cold there is deficient circulation of the blood through the parts, and the result is an excessive accumulation of blood in the liver, stomach, spleen, and other abdominal organs. The congestion of blood in these parts interferes seriously with their functions. The brain, spinal cord, and lungs are also congested and various mischiefs result; hence the feet must be kept warm.

The feet are not cold because the circulation is weak, but because of spasm of the blood vessels of the extremities due to irritation of the vasomotor centers of the spine. This is generally the result of absorption of poisons from the alimentary canal. Coldness of the hands and feet is a common symptom of intestinal autointoxication. This condition is promoted by flesh eating, by hasty eating, by excessive eating, by an inactive state of the bowels, and by whatever interferes with good digestion.

Many neurasthenics suffer almost constantly from coldness, and often clamminess, of the hands and feet. This symptom is most likely to appear soon after eating. It may also be induced by mental or nervous excitement. Temporary relief may be obtained by rubbing, or by alternating hot and cold applications to the spine. The abdominal supporter sometimes affords complete relief by supporting the abdominal viscera and thus preventing reflex irritation of the vasomotor centers.

Bunions

Q. **What is the best treatment for bunions?**

A. Bunions are the result of wearing shoes which are too narrow at the toe. Benefit may be obtained by wearing sandals and shoes with wide toes. In very bad cases an operation may be necessary. Bunion plasters give great relief by preventing pressure.

Weak Ankle

Q. **Prescribe treatment for a weak ankle which turns frequently.**

A. The ankle may be strengthened by special exercises, especially toe walking. Bathe the parts in cold water daily, applying a heating compress at night. Do not wear low shoes. A leather ankle support may be made by any shoemaker. In bad cases a special apparatus may be needed. In such cases a surgeon should be consulted.

Ingrowing Toe Nails

Q. **What can be done for ingrowing toe nails?**

A. Ingrowing toe nails may be radically cured by a simple operation. If the difficulty is slight, it may be cured by wearing a broad-toed shoe, scraping the center of the nail and taking care to give the nail a square edge to prevent the corners from penetrating the flesh.

Feeble Feet

Q. **What are the causes of feeble feet?**

A. The American foot, like American teeth, and the American man in general is undergoing a process of degeneration. The same is true of the feet of civilized man everywhere. Often the little toe is found with only two joints instead of three, and occasionally the condition extends to the toe next to the little toe. The great toe, also, is becoming smaller and less serviceable. The great toe of the Filipino, for example, is so much longer than the other toes and so far separated from them that it renders real service in grasping and clinging.

The Japanese, likewise, have great toes so well developed that they enable the Japanese carpenter, for example, to clamber about with perfect safety on roofs upon which the European could not possible maintain a foothold.

A more serious defect in the feet is the tendency to flat-foot, which appears to be rapidly increasing. Flat-foot is the natural result of the wearing of shoes, especially of ill-fitting shoes. The ligaments and muscles which bind together the bones which form the arch of the foot, or instep, become weakened by over strain and over exertion, and especially through lack of development, as the natural result of wearing tight and ill-fitting shoes. With the flattening of the arch, the toes turn outward, producing the condition known as *splay* foot, when the flattening of the arch has developed to an extreme degree.

The pain and inconvenience occasioned by

breaking down of the arch of the foot is often so great as to incapacitate a person for walking except for short distances or for occupations which require much standing.

This defect is one of the most common of all causes of incapacity for military duty. Military examining surgeons report the finding of a large number of men in whom a tendency to flat-foot exists, but in whom the effect has not yet reached sufficient proportions to justify exemption from service.

These cases are found to be, ordinarily, incipient cases. The difficulty is found to be readily curable by a very small device, which consists of raising the inner border of the sole of the shoe by the application of a wedge-shaped piece about one-quarter of an inch in width at its thickest part which is placed inside of the shoe. The effect of this is to throw the weight of the body upon the outside of the foot. This relieves the pressure upon the arch and restores equilibrium. It is necessary also, that the shoes should be roomy, so as to permit free action of the muscles of the foot.

The wearing of insoles or arches to support the instep does not remove the cause of the difficulty, and so does not correct the defect. Such supports give temporary relief from the strain upon the instep, but on the whole have a tendency to aggravate the difficulty. On this account, this very commonly used device is condemned by orthopedic surgeons.

Certain measures of treatment are of great value as a means of alleviating the condition of

flat-foot when the arch is not yet completely broken down.

Among the best of these is walking on the toes with the feet apart and the heels turned out. This should be practiced several minutes night and morning.

Bathing the feet in very cold water is a measure of value. The effect of cold water is to increase the tone of the muscles of the foot and to improve the blood circulation of the parts.

An eminent surgeon says "modern women are never allowed to be anatomically normal after they are two years old. This statement seems more extreme than it really is. So soon as a child begins to walk about, its shoes are made stiffer and higher about the ankle. Thus its weight is thrown back, and the habit of walking on the heels and throwing forward the hips is begun. From this time on, shoes are rarely wide or flexible enough across the ball of the foot, nor sufficiently free over the instep and ankle. The feet are being grown to suit the fashionable shoe of the day. The wrong carrying of the weight of the body makes ills that are patched up by palliative measures of various kinds, but are almost never radically attacked by righting the body's most important relation to its base of support."

Sore Feet

Q. **What are the best means for preventing soreness of the feet due to walking?**

A. The British Red Cross Association has prepared the following excellent rules for the care of sore feet.

1. Feet should be washed with soap and water, and very gently dried—not rubbed.

2. Dab with methylated spirit on absorbent cotton, except where the skin is broken.

3. When dry, dust with powder composed of equal parts of starch and boracic acid or fuller's earth.

4. Bandage with clean bandage, not too tight—or else put on clean socks. All soiled socks should be washed and dried before use.

5. Reddened skin or recent blisters should be protected by strips of strapping.

6. All corns should be protected by strapping. Open sores require surgical advice, and this should be sought whenever possible, especially if the surrounding redness of the foot is extending.

7. Toenails should be cut short and square—not too short.

Dry Skin

Q. **What is the cause of a dry skin?**

A. The skin naturally secretes a fine oil which serves as a lubricant and protects the body from excessive loss of heat. It also serves as a natural means of cleansing the skin. This oil is secreted by the oil glands of the skin. These, as well as other glands of the skin are under the control of the thyroid gland. When the activity of the gland is diminished, as it sometimes is, especially in persons past middle age, the skin becomes dry. The hair usually begins to fall out and to become less vigorous in growth from the same cause. Constipation and the resulting intestinal toxemia is probably the chief cause.

The bowels should be made to move three times a day (see Constipation) so as to keep the body free from toxins. Water must be taken freely, two or three quarts a day. Bathe only in soft water and be careful to remove all soap from the skin. After the bath apply lanoline cream. It is well also to apply a little of the cream daily, especially if there is a tendency to irritation, itching, burning, or "breaking out."

Lanoline Cream—"Skin Food"

Q. **What is the best "skin food" or ointment for the skin?**

A. There is no such thing as "skin food." The many advertised "skin foods" are usually simple ointments prepared from lard or other cheap grease of some sort and highly perfumed. The skin cannot be fed by rubbing anything upon it or into it. The skin is not a stomach. The skin is a breathing organ and an excreting organ. The skin lets things out. It takes very little in. It will take in moisture to a very slight degree. Friction improves the circulation of the skin and thus helps its nutrition. When natural oil of the skin is deficient, oil in some form should be applied daily. The best skin lubricant is the following, prepared from a formula given the writer by an eminent New York skin specialist:

Lanolin	2	ounces
Boro-glyceride	1	"
Cold cream made with white vaseline	6	"

Apply daily when the skin is dry or chapped. When there is much irritation of the skin 10

grains of carbolic acid or menthol crystals may be added to each ounce of the mixture. To relieve severe itching apply hot water (120° F.) and afterward lanolin cream containing, if necessary, both carbolic acid and menthol.

To Relieve Itching

Q. **What is the best means of relieving itching?**

A. Heat is almost a panacea for itching, no matter what the cause. But the temperature of the application must be high, 120° F. at least. Water at this temperature may be splashed over the part, or cloths may be dipped in hot water and applied. Here is a good method:

Dip a soft, smooth, folded towel in very hot water, holding by the dry ends. Press the surplus water out by drawing over the edge of the bowl. Apply to the itching parts in a "touch and go" fashion, making the contacts longer as the temperature lowers, until it is possible to press the wet towel firmly against the skin for a minute. The temperature must be high enough to be slightly painful, but take care not to actually burn the skin.

After the hot application, apply "Lanolin Cream." The plain cream is usually sufficient, but in aggravated cases, add to the cream two per cent of carbolic acid or menthol, or both (10 grains to the oz.).

Repeat the hot applications as often as necessary. The itching usually ceases for several hours, and after a few days disappears.

Chapped Hands

Q. **What is good for chapped hands?**

A. The sensitive parts of the skin are protected by a thin horny layer. Dry cold air cracks this natural protective covering and exposes the sensitive structures beneath. When the hands are washed with soap in hard water, some of the insoluble lime soap which is formed is left upon the skin, and this increases the tendency of the skin to crack or chap. If the hands are soiled, the chapping gets worse because of infection of the raw surface exposed at the bottom of each crack.

The remedy is simple. Keep the hands perfectly clean by washing with good soap and soft water (rain or snow water, distilled or softened water). After washing, rinse the hands in clear water until all the soap is removed. Wash in a running stream, not in a bowl. Apply "lanoline cream" night and morning, and rub in well.

Dingy Complexion

Q. **What is the cause of a bad or dingy complexion?**

A. No one admires brown circles around the eyes, and brown patches on the hands, and a leather-colored skin. What these things mean is that behind the leather-colored skin is a bad breath. Behind the bad breath is impure blood—blood charged with these same offensive aromas that are coming out in the breath, for that is where these offensive odors come from. The blood picks them up in the colon and other parts of the body and carries them to the lungs, where they are poured into the breath. The breath is

bad because the whole body is bad. It is not simply the breath that smells bad—the whole body is tainted. Even the perspiration is offensive, because some of the poisons that do not escape by the breath escape by way of the skin—foul putrescent materials that ought to be carried out through the bowels, but are obliged to escape through the lungs, kidneys and the skin.

A dingy skin can not be cleared by rubbing on cosmetics or lotions of any sort. The cleansing process must be thorough-going. First of all the diet must be changed. Stop eating meats and rich foods. They rot in the colon and produce the poisonous brown pigment which tinges the skin, *brenzcatechin*. Make the bowels move three times a day by the use of sterilized bran and paralax or some other good preparation of paraffin. Drink three quarts of water daily. Sleep in the open air on a porch or at least with open windows at all seasons. Take a sweating bath twice a week and a cold air bath or cold towel rub every morning. Live simply, biologically, scientifically.

A brown skin means that the possessor is growing old too fast. It is necessary to cultivate youth by obeying the laws of health and keeping the body clear of poisons.

Sensitive Skin

Q. **Why do my hands itch and burn in cold weather?**

A. Doubtless you have a very sensitive skin. You should protect it by applying to it a coating of oil. Lanoline cream is best. (See index.) Take great pains also when cleaning the hands

not to leave soap on the skin. The hands should always be washed in running water, and not in water held in a bowl or basin. The first use of water in a bowl soils the whole quantity and it is then impossible, no matter how long the process is continued to get the hands clean in unclean water. The reason why the hands chap in cold weather is generally that either dirt or soap is left on the skin, producing an irritation.

Oily Skin

Q. **What can be done for oily skin?**

A. In some persons there is an excessive production of sebaceous matter or sebum, due to morbid activity of the fat glands of the skin. The skin of such persons presents a shiny look. Little beads of oily matter may be seen at the mouths of the glands near the roots of the hairs. The forehead, nose and cheeks are most frequently affected. When the scalp is affected, the condition may be indicated by soiling of the pillow. Acne is frequently accompanied by this condition.

When many of the glands are clogged up, as indicated by the abundance of blackheads, the surface should first be thoroughly rubbed with warm oil. Cocoanut or almond oil is the best. After half an hour the surface should be rubbed with a flannel cloth, thoroughly saturated with soap moistened with warm water, and stretched over the fingers; or a soft sponge may be used. This is best done at night, just before retiring. Repeat every few days. The X-ray has proved itself very serviceable in oily skin and seborrhea. It cures by destroying the glands.

Excessive Perspiration

Q. **What is the best means of checking excessive perspiration?**

A. Excessive perspiration is often a neurasthenic symptom and is due to toxemia. The skin is making an effort to remove from the blood the poisons with which it is congested. Excessive perspiration is often a common symptom of tuberculosis. Neurasthenics are likely to sweat profusely when they fall asleep and when subject to nervous strain of any sort. The consumptive sweats at night. Sponging the skin with very hot water at bed time is an excellent means of lessening the night sweats. The neurasthenic should unload his overloaded colon by making the bowels move three or four times daily, not for a few days only but habitually. A non-flesh diet and careful following of the simple life rules will in time effect a cure.

Lupus

Q. **What is this disease and is it contagious?**

A. Lupus is simply tuberculosis of the skin. It may be communicated the same as other forms of tuberculosis but is less likely to be a source of infection for the reason that the germs of this disease are very deep in the skin and are not likely to be spread about as are the germs which develop in connection with pulmonary tuberculosis and with which the expectorated matters of the patient are teeming.

Wens

Q. **What causes the growth of wens?**

A. Obstruction of the oil glands in the skin. These glands manufacture a fatty substance which is normally expelled upon the skin. This substance accumulates when the opening of the ducts becomes obstructed, and forms a tumor, commonly called a wen.

Removal of Wens

Q. **Can a wen be removed without a knife?**

A. It might be removed with caustic applications, but it would be painful and bungling, and leave an unsightly scar. The knife is the only proper means; it makes a clean wound which heals immediately.

Small Seed Warts

Q. **What is the easiest way to remove small seed warts?**

A. Put on a little acetic acid every night with the tip of a wooden toothpick and in a few days the wart will soften and rub off. Radium and carbon dioxide ice are painless and certain remedies for warts.

Leucoderma—Piebald Skin

Q. **Is there any cure for leucoderma, or any way to prevent the spread of it?**

A. Correction of the auto-intoxication to which this condition is usually due will arrest the spread of the skin changes, and the writer has seen one case in which the natural color of the skin returned.

Warts and Moles

Q. How should warts and moles be removed?

A. The best means is freezing with carbon dioxide ice. Radium is also effective and the X-ray.

Excision, that is, removal by the knife, is a satisfactory method of dealing with these abnormalities if the work is done thoroughly. In the case of moles it is highly important that the entire mole should be removed. A small fragment left behind may develop into a cancer. Incomplete removal has led to the popular notion that operation is dangerous in these cases. As a matter of fact, nothing is more dangerous than *incomplete* operation except an injury, which is still more likely to lead to cancer development.

Enlarged Pores

Q. Can the skin of the cheeks and nose with enlarged pores be made normal?

A. The most that can be said with reference to this condition is that it can be greatly improved.

The Senile Skin

Q. What is the significance of brown spots on the hands and a shiny appearace?

A. The skin is a very good indicator of a person's real age. "A man is as old as his arteries," as his kidneys, also as his skin. A thin, shiny, wrinkled, inelastic skin, indicates senility, no matter what the person's age. Large dark brown spots on the hands have the same meaning. The skin is thin because it has undergone degeneration and this condition of the skin

accompanies similar degenerations which are taking place in all parts of the body. In many cases the skin may be very greatly improved by baths, massage, sun or electric light baths and by a strict antitoxic and laxative diet. The bowels must be made to move three times a day by proper diet and the use of paraffin oil, bran or agar-agar, and the kidneys must be kept active by free water drinking.

Brown Patches on the Skin

Q. **Why do brown spots, somewhat resembling freckles, appear on the hands and what is the cause of them?**

A. They are an evidence that degeneration of the thyroid gland and of the suprarenal capsules of the kidney has taken place. Long retention of putrescible food material in the colon is the cause. A product of the decay that thus takes place is certain brownish coloring matters which are absorbed into the blood. It is one of the functions of the suprarenal capsules to destroy this brown coloring matter. But when these glands have too much work to do, because of the flood of poisons pouring into the blood continuously, they get worn out. And so the brown coloring matter is left as a deposit under the skin. Most often the hands, but the face and all portions of the body are subject to them. In one whose antitoxic glands have entirely failed, the whole skin may be as brown as an Indian's.

The only safe plan is to avoid the difficulty by eating natural foods (grains, vegetables, nuts and fruits), and by frequent bowel movements,

keeping the colon from becoming a storage place for body waste and poisons.

Pimples

Q. What is the safest and surest way of getting rid of pimples on face, neck, chest, and arms? Are any of the face creams advertised on the market useful?

A. Pimples or acne on the face and other parts are the result of lowered vital resistance, almost invariably the result of intestinal autointoxication. Bathing the parts with very hot water is beneficial, but a rapid cure can be accomplished only by the adoption of an antitoxic diet and care to secure thorough movement of the bowels two or three times daily.

Vigorous outdoor exercise sufficient to cause free perspiration, copious water drinking (two or three quarts a day), avoidance of meat and especially of animal fats, abundant use of fresh fruits at every meal and the free use of bran, sufficient to make the bowels move freely three times a day, are the best means of raising vital resistance. Sometimes the use of an autogenous vaccine is necessary. The application of the X-ray by a skillful roentgenologist is a very certain method of cure and the actinic ray of the electric light is almost equally efficient. Sunburning is a most excellent method.

Prickly Heat

Q. How can I rid myself of prickly heat?

A. Prickly heat, or heat eruptions, accompanied by severe prickling and itching, generally disappears within a few hours, but it

may continue for some time and finally become eczema. Persons subject to prickly heat should wear cotton or silk next to the body, and should avoid overexerting themselves during hot weather. The irritation may be relieved by cool sponging and by bathing the surface with soda or saleratus water, a teaspoonful to the pint. After bathing, the surface should be dried by a gentle patting with a soft towel, without rubbing. Rice powder or borated talcum powder is useful.

Salt Rheum—Eczema

Q. **What is salt rheum?**

A. Salt rheum is a common name for eczema, or moist tetter. This is the most common of all skin diseases. Eczema appears in various forms. When acute it is characterized by intense burning, or itching, with a watery discharge; when chronic the skin thickens and scales and scabs form. This condition is generally caused by intestinal toxemia, inactivity of the bowels and a high-protein diet.

Salt rheum is curable by regulation of the diet and by application of other means. A cure can always be hastened by local applications; especially by the use of the X-ray. Light applications are also useful in some cases. The burning and itching can be greatly relieved by an application of gauze wrung out of very hot water. The temperature of the water should be as hot as can possibly be borne. Cloths wrung out of hot soda water (a teaspoonful of bi-carbonate of soda to a pint of water) generally afford relief.

Eczema in Infants

Q. What is the remedy for eczema in infants?

A. Eczema is generally due to constipation, indigestion or colitis. First of all the diet of the child must be regulated so as to secure normal digestion. The bowels should move at least three or four times a day. The bowels normally move after each feeding. In some cases cow's milk seems to be a cause of eczema in young children. In such cases the amount of milk in the diet should be diminished. In some cases it may be necessary to suspend milk feeding entirely for a few days substituting gruels and vegetable purees to which a little butter has been added. Malt sugar should be used to the extent of one or two ounces daily. The irritation of the skin may be relieved by the use of lanoline cream. (See index.)

Red Spots Under the Skin

Q. What causes small red spots, like blood, to form under the skin?

A. Rupture of the blood vessels from degeneration of the vessel walls. The case may be a very serious one, and the patient should be placed under the most skilled medical care immediately.

Ringworm

Q. What is the cause of and cure for ringworm?

A. Ringworm is a parasitic disease. Paint the part with tincture of iodine, turpentine, or a strong solution of borax. Improve the general health. The X-ray is a certain cure.

Defects of Nails

Q. **What is the cause of ridges and white spots on the nails?**

A. Slight defects in the nutrition of the nail, which probably indicate some general impairment of nutrition at the time when the affected part of the nail was being formed, such as loss of sleep, attack of indigestion, or some other illness. A very common cause is chronic constipation, which disturbs all the bodily functions by causing the absorption of poisons.

"Winter Itch"

Q. **Is there a remedy for "winter itch?"**

A. Many persons suffer from intolerable burning or itching which makes its appearance at the beginning of cold weather and disappears with the first warm, damp days of spring. The cause is fine chapping or cracking of the skin due to the dryness of the air. At first no eruption appears; but after the parts have been rubbed, redness appears, and often the characteristic appearance of eczema or salt rheum.

Almost instant relief from the intolerable itching or burning may be obtained by bathing the parts with very hot water. The temperature must be 115° to 122° F. The water may be poured on from a basin or applied by means of a soft, folded towel wrung out of water hotter than the skin will bear without injury if contact is prolonged. The water should be dashed on, or the towel applied for a few seconds then withdrawn and reapplied.

After the hot application, smear well with lanoline cream. (See index.) Repeat the treat-

ment twice a day. Carefully avoid rubbing or scratching, as this will cause infection and may give rise to eczema.

The method of applying hot water above described may be applied to any part of the body for relief of itching from any cause.

Pigmentation of the Skin

Q. **What is the cause of pigmentation of the skin observed in intestinal toxemia?**

A. Combe and other investigators have shown that pigmentation of the skin is due to the absorption by the intestine of certain coloring matters produced by the putrefaction of protein. The most important are brenzcatechin and alkapton, highly poisonous substances produced by decay of meat in the colon.

Freckles

Q. **Is there any safe method of removing freckles?**

A. Superficial freckles may be removed by lotions of various sorts, such as lemon juice and boracic acid, buttermilk compresses, etc. Permanent freckles which are not caused by exposure to the sun and wind and which are due to deposits are, in many cases, the result of intestinal autointoxication. A coloring matter known as brenzcatechin is formed by the decomposition of animal substances in the intestine.

The deposit of these substances in the skin gives rise to the brown spots and patches sometimes known as liver spots. The adoption of an antitoxic diet, free water drinking, sweat-

ing baths, abundant exercise out of doors, sleeping out of doors, and other measures which promote purity of the blood and improve the health will often cause the disappearance of these blemishes.

Care must also be taken to make the bowels move three times a day (see constipation). Large, dark brown spots and "moles" may be removed by the careful application of carbon dioxide ice.

Boils

Q. **What is the cause of boils and how may they be prevented?**

A. Boils are directly due to infection of the tissues with germs. There are always found upon the skin germs which are capable of producing boils and other suppurative processes if introduced into the system. Ordinarily, however, the body does not suffer from the close proximity of these noxious elements, for the reason that the tissues are able to destroy, in various ways, the small number of bacteria which penetrate the skin. When, however, by any means the vitality of the system becomes lowered to a sufficient degree, invasion by these parasitic microbes through a scratch, a pin prick, or any other abrasion of the skin, may give rise to the multiplication of germs under the skin and the production of pus, with the accompanying swelling, pain, and inflammation.

A person subject to boils should build up his resistance by simple living,—cold bathing, out-of-door life, day and night, abstaining from flesh foods and meats of all kinds. The diet should consist chiefly of fruits and vegetables.

The bowels should be made to move three or four times daily. If the boils still continue to appear an auto vaccine should be prepared and administered. In most cases immunity may be quickly established by this method.

Treatment for Boils

Q. **What treatment is of value for boils?**

A. The application of heat and cold alternately will sometimes disperse a boil in the early stage. When it becomes painful, apply hot fomentations frequently, with the wet compress during the intervals, or apply continuously a soft poultice. The wet compress covered with oil-silk has the same effect as the poultice. The kind of poultice is quite immaterial, if it be non-irritating, for its only valuable properties are warmth and moisture.

When the boil is ripe, that is, when a little white vesicle appears near the surface, its cure may be hastened by lancing with a sharp knife. The discharge may be encouraged by gentle pressure; but squeezing boils is a very harmful practice, and greatly retards their cure. After opening, a boil should be dressed with compresses wet with boracic acid solution, or with a five per-cent solution of common salt. Applications for the treatment of boils, to be effective, should include the surrounding tissues as well as the boil.

A carbuncle is simply a large boil. A sty is a small boil on the eyelid. Treatment for each is the same as for ordinary boils.

It is a mistaken notion that the purulent matters discharged from boils are concentrated impurities which previously existed in the blood.

The pus itself is made up of the white blood corpuscles, the most precious part of the blood. It is an error to suppose that boils are in any way beneficial to the health. They are due to infection and are caused by low vital resistance. This condition is commonly expressed by the term "bad blood," or a "low state of the body." A person in this condition should proceed to build himself up by "right living" as quickly as possible, otherwise he may fall a victim to some malady much more serious than boils.

Ulcers

Q. How may the offensive odor of ulcers be removed?

A. Old ulcers on various parts of the body are frequently very offensive as well as painful. To remove the odor emitted by the discharges, apply cloths wet with Dakin's solution. Alternate hot and cold applications once or twice a day hastens the healing of chronic ulcers.

Blackheads—Comedo

Q. Is there an efficient remedy for blackheads?

A. When these are present in large numbers, the face appears as though gun powder had been blown into it, or pepper sprinkled over it. It is best to remove them, as, if not removed nature undertakes the work by setting up an inflammation about each one and producing real acne. They may be squeezed out by pressure between the nails, but are best removed by a little tube with an opening about a thirty-second of an inch in diameter, or a watch key,

which should be pressed directly down upon the affected gland, care being taken not to injure the skin by too great pressure. The further treatment of comedo should be the same as recommended elsewhere for oily skin.

Beri-beri

Q. **What is the cause of beri-beri?**

A. Beri-beri is caused by lack of vitamines. It is generally due to an exclusive diet of polished rice, but may be caused by fine wheat flour.

Cause of Nettle Rash

Q. **What causes nettle rash?**

A. Poisons absorbed from the intestine, or acute intestinal toxemia. This is now thoroughly demonstrated. There was recently a symposium on the subject of intestinal toxemia in London at which sixty of the most distinguished men of England took opportunity to attend and all agreed that nettle rash is practically always due to poisons absorbed from the intestine.

Treatment for Nettle Rash in an Infant

Q. **What is the proper treatment for nettle rash in an infant.**

A. Bathe with very hot water containing a dram of salt or soda to the pint. The child's diet should be corrected. Nettle rash is due to indigestion. A physician should be consulted in regard to a change in the baby's food. Usually the child is constipated. Malt sugar and orange juice may be needed.

Heat Rash

Q. What is the cause of a rash that comes out on the arms and wrists when a person becomes heated?

A. There is doubtless a hypersensitive condition of the skin, very possibly the result of an acrid state of the perspiration. This condition is generally the result of a chronic toxemia arising from the absorption of putrefactive products from the intestine. Relief can generally be obtained by cleansing the parts daily with distilled or soft water, by bathing with alcohol, and the free use of borated talcum powder.

Bruises

Q. What is a good treatment for a bruise?

A. For severe contusion in consequence of a blow received on any of the soft parts of the body apply a hot fomentation as soon as possible after the accident. Repeat the fomentation at intervals of two or three hours as long as the bruise remains sore and painful. During the interval apply over the part a compress consisting of a towel wrung as dry as possible from cold water, and covered first with mackintosh, then with several thicknesses of flannel to maintain warmth. The hemorrhage beneath the skin which frequently occurs in consequence of a severe bruise, may generally be prevented by firm compression immediately after the injury. It is a custom among German mothers when a child falls, striking its head severely, to apply the convex surface of the bowl of a teaspoon immediately on picking it up. The compression can be kept up by means of a pad and bandage.

When a person has been much jarred by a considerable fall, or more or less bruised all over, a hot full bath or a hot blanket pack will give more relief than any other remedy. This measure should not be applied however when the patient is faint.

In case a person has been bruised about the trunk or body, by having a tree fall on him or being run over, the services of a skilled surgeon should be obtained as soon as possible. Hot fomentations or a hot full bath may be employed in the meantime.

Bruises upon the head in consequence of severe blows or a fall, often give rise to serious symptoms on account of fracture of the skull and compression of the brain, or from simple concussion or jarring of the brain. If a person is insensible or partially paralyzed in consequence of an accident in which the head is injured, surgical advice should be secured at once. As a general rule, continuous cold is the best application for injuries resulting from severe blows upon the head. Fomentations may be applied at intervals to relieve soreness, but the application should be continued not longer than five or ten minutes at a time.

Necessary Hours of Sleep

Q. **How many hours of sleep are required?**

A. A very few persons may be able to get along fairly well with six hours, but eight hours of complete rest in bed are required by the average person. Many persons who have a predisposition to neurasthenia require an hour or two more. Few persons are able to work for any length of time with less than

six hours sleep. The stories told of persons who habitually require but four hours sleep are not authentic.

Napoleon slept but four hours in his bed but took naps in the day time. The Duke of Wellington slept four hours at night but often fell asleep at the dinner table and sometimes when riding. Mr. Edison advocates four hours sleep as sufficient, but in addition to four hours in bed often takes naps in the day-time on a bed in his laboratory. His intimates say that he sleeps as much as most people do, which is six to eight hours in twenty-four.

How to Go to Sleep

Q. **What is the cause of sleeplessness?**

A. Sleeplessness may be due to too much blood in the brain, or to irritating poisons in the blood. It is not a cure that should be sought so much as a removal of the cause.

Insomnia is usually accompanied by constipation, and is the natural result of the absorption of poisonous matters from the colon.

The putrefaction of the undigested remnants of food in the colon gives rise to the formation of poisons of various kinds, some of them capable of exciting the brain and nerves in such a way as to give rise to insomnia.

It is generally impossible to cure insomnia without relief of the accompanying constipation.

A neutral bath at bedtime is an excellent aid in getting oneself to sleep. This consists of a full bath at a temperature of 92° to 96° F. A bath of this temperature has wonderful calming and sleep-producing effects.

The duration of the bath may be as long as necessary to produce the desired effects. Several hours in the bath may be required. Sooner or later the disposition to sleep will come, and then the patient may leave the bath and retire.

In getting out of the bath great care must be taken to avoid chilling, even in the slightest degree. Do not cool off in the manner usual after warm baths, but wrap yourself in a Turkish sheet and gently dry (not rub) your body, and then slip into a warm bed as quickly as possible.

A warm foot bath taken just before going to bed will often induce sleep by withdrawing the blood from the head. The moist abdominal bandage—a wet bandage well covered with flannel so as to produce thorough warming will often accomplish the same result.

In addition, the following rules as to eating should be observed:

1. Eat no meat dishes of any kind.

2. Take only a light supper, consisting of fruits, with perhaps a glass of buttermilk or plain soup of some sort. Avoid bread and butter, cake, pastry and all indigestibles. The less work the stomach has to do during the night, the sounder the sleep will be.

3. Drink neither tea nor coffee.

4. Drink two or three quarts of water daily.

5. Make the bowels move three or four times a day by the use of laxative foods. The bowels ought to move after every meal.

6. Live out of doors as much as possible, and sleep in a tent or on a porch so as to breathe fresh air when asleep.

7. Take enough muscular exercise every day to really tire yourself.

8. Avoid excitement of any kind before going to bed.

9. Avoid feather mattresses and pillows, and too much bed covering. The bed covers should be light and porous.

Sleep and Longevity

Q. **Does much sleep tend to lengthen life?**

A. Yes. During sleep the pulse is slowed and all the life processes slackened to a pronounced degree. The winter sleep of plants and of hibernating animals no doubt greatly contributes to their life duration. A hibernating animal uses so little energy that no food is taken for six months or even more in some cases. The heart beats only a few times a minute and respiration occurs only three or four times a minute.

If human beings could hibernate, the result might be a marked increase in longevity. The rest cure systematized by Weir Mitchell is a sort of hibernation, plus feeding.

Persons who afford examples of great longevity are invariably good sleepers.

A most remarkable example of sleep indulgence associated with longevity is afforded by the two sisters of Brillat-Savarin, the famous French judge who fled to this country during the French revolution, and afterwards wrote a famous book on the art of eating, in which he laid special stress upon thorough mastication and, in fact, anticipated the chewing campaign of Horace Fletcher.

It is related of the sisters, who lived in a country house belonging to the judge and visited by him only once a year, during the months of September and October, that "they spent ten months of the year in bed, getting up two days before his arrival, and living a normal life during his stay. On his departure they would say: 'Goodby until next September, Anthelme. We are going to bed.' One of them died at the age of ninety-nine, as she was finishing dinner, her last words being, 'Hurry up with the dessert.' "

The other sister is said to have reached nearly the age of one hundred years.

Plenty of sleep is no doubt conducive to long life. Growth in young animals, and repair in all living things is most active during the hours of sleep and rest. When the amount of sleep is insufficient, the result is incomplete repair, and hence an undue amount of wear and tear and premature decay, decline and death.

Cause of Insomnia

Q. **What is the cause of sleeplessness or insomnia?**

A. The disease may be due to too much blood in the brain, or to irritating poisons in the blood.

Insomnia is most frequently due to autointoxication. Colon poisons excite the brain, producing at the same time a sense of exhaustion with inability to sleep or rest. Eating heartily at night is another potent cause of sleeplessness. The sufferer awakes about two or three o'clock A. M. and cannot sleep longer because of the absorption of digested food which stimulates the brain cells.

Drowsiness

Q. **How may one relieve drowsiness?**

A. A person who cannot sleep at night is often afflicted with an almost irresistible drowsiness during the day, especially after meals. Inability to keep awake in church or at a lecture is not uncommon. This difficulty is especially common in visceral neurasthenics, who often suffer from drowsiness when sitting or standing, but become wide awake on assuming the horizontal position. These persons suffer from lack of vasomotor regulation, and so are at the mercy of gravitation—when upright the blood runs into the dilated abdominal vessels; when horizontal, the blood runs back to the head, so that the brain is alternately drained of blood and overcharged.

For temporary relief, bathing the face and neck with very hot or cold water, or with hot and cold water in alternation, are most efficient measures. Drinking half a glassful of hot water and lying upon the face over a pillow for a few minutes, avoiding sleep, are simple measures which often afford prompt, if temporary, relief.

Food at Bedtime

Q. **Is it true that food may be used to promote sleep?**

A. Eating causes drowsiness by diverting blood from the brain to the stomach; but it is far better to draw the blood from the brain by warming the feet than by exciting the stomach. Or, if it is necessary to divert the blood into the abdominal veins, this may be done by a moist abdominal bandage, thus saving the stomach the labor of digesting the food. One might divert

the blood from the head to the feet by walking, but this would exhaust one's energies if he were already tired. The effort of digestion is likewise exhausting, and interferes with sleep.

Avoid Drugs in Insomnia

Q. **May sleep producing drugs be used safely?**

A. Sleep obtained by the use of opiates, is by no means a substitute for natural sleep. The condition is one of insensibility, but not of natural refreshing recuperation. Three or four hours of natural sleep will be more than equivalent to double that amount of sleep obtained by the use of narcotics. When a person once becomes dependent upon drugs of any kind for producing sleep, it is almost impossible for him to dispense with them. It is often dangerous to resort to their temporary use, on account of the great tendency to the formation of the habit of continuous use. The most effective means of combating sleeplessness when known causes of this condition have been removed is the neutral bath. This consists of a full bath given at a temperature of 92° to 96° F. The temperature should never be higher or lower. The neutral bath quiets the nervous system by saturating the cutaneous nerves with water and thus diminishing their sensibility. The absorption of water from the bath stimulates the action of the kidneys and thus carries away the irritating poisons. Practically every case may be relieved by the neutral bath if the bath is continued long enough. In insane asylums patients are frequently kept in the bath two to five hours. No

injury results from this bath, no matter how long it is continued. The neutral pack (see index) may be used when the neutral bath is not available.

Sleep Walking—Somnambulism

Q. **What is the cause of sleep walking?**

A. The habit of walking about while asleep is one of the most curious of all the phenomena of nervous action. The somnambulistic state is simply an exaggeration of the state of dream. It is a condition in which the intellectual faculties are dormant, while many parts of the brain seem to be even more active than usual. While in this curious state, persons will accomplish feats which would be impossible for them while awake.

Many remarkable instances of somnambulism are recorded. For example a story is told of one Cortelli, who was found one night asleep in the act of translating from a dictionary. When his candle was extinguished, he arose and went to seek another light.

The Archbishop of Bordeaux tells a story of a theological student who wrote sermons while he was asleep. He continued to write after the paper was removed and while he was revising a page requiring correction, a piece of blank paper of the exact size was substituted for his own manuscript, and on that he made the corrections in the precise situation which they would have occupied on the original page.

Nightmare

Q. **What is the cause of nightmare, and the best remedy?**

A. Nightmare is a nervous disorder occurring during sleep, most frequently the effect of indigestion. The remedy is to avoid eating at night—avoid sleeping on the back, especially; see that the bowels are emptied before retiring. An excellent precaution is to take a neutral bath for half an hour just before going to bed.

Mouth Breathing During Sleep

Q. **Why does a person sleep with the mouth open?**

A. There is probably obstruction of the nose which must be removed. In some cases where mouth breathing is only a habit it is necessary to close the mouth by means of a bandage or some other device.

Indoor Life

Q. **Why is indoor life productive of disease?**

A. Man is naturally an out-of-door dweller. Trees, shrubs, plants of all sorts, die in the ordinary house. No plant, and few lower animals, can long survive the conditions which prevail in the ordinary modern house. The bad air, excessive heat, varying temperature, and lack of sunlight, are deadly enemies of life. Plants droop, their leaves wither, their flowers fade, buds fail to open, seeds do not form, growth is stunted, and finally there come death and decay.

Animals lose their vivacity, cease to grow, produce either no young at all or weakly, weaz-

Fresh Air Sleeping Arrangements

Fresh Air Sleeping Arrangements

ened offspring, become puny, scrawny, rickety, often tuberculous.

The modern house, the office, the counting room, the factory, the store, the schoolhouse, as well as the sweat shop and the crowded tenement,—these are all incubators, breeding places of disease and death.

Sleeping Out-of-Doors

Q. **Is sleeping out of doors safe in all climates?**

A. Yes. It is more convenient in warm climates than in cold, but is none the less beneficial in cold than in warm climates. In fact, it is probably more necessary for the reason that in warm climates windows and doors are usually wide open so there is a free circulation of air; whereas, in cold climates the houses are usually tightly closed and ventilation deficient.

But to sleep out-of-doors one must be dressed for it. It is absurd in the extreme to expect to dress for outdoor sleeping as one dresses to sleep in a heated room, even though the windows are open. Dress as if you were going for a sleighride. Have plenty of light, warm bed clothes. Wear a warm gown or pajamas, and if necessary, a bathrobe. If you have a tendency to cold feet, you will find bedsocks of advantage. And if you are sensitive to drafts about the head, you would do well to wear a night cap.

With proper apparel and a dietary directed to the production of heat, there is no reason why all persons except the aged or those unaccustomed to a cold climate should not sleep out-of-doors all winter long. And once you have

begun the habit of sleeping out, keep it up. It is a mistake to come in for a single night, no matter how severe the weather. By so doing one lays himself liable to a cold and he is more sensitive to the cold upon going out again after sleeping in. If electric current is available, a great convenience for the coldest nights is an electric pad which may be turned on long enough to warm the bed and then turned off. If you have difficulty in getting warm when you first go to bed, you will find hot sand bags, hot bricks, or hot water bags an advantage.

Sleeping out has its inconveniences, but they are many times offset by the feeling of buoyant spirits, renewed health and keen mind which come with outdoor sleeping. Try it.

Sleeping in a Tent

Q. **What is the best arrangement for outdoor sleeping in a tent?**

A. It is simply necessary to take care to see that the tent is open so that the air can circulate through. One may shut a tent up so tight that he will be a great deal worse off than if indoors, because the tent does not let in so much light as do glass windows and the fresh air admitted may be less than in a well ventilated room.

Disturbed Sleep

Q. **How may one fall asleep quickly after being disturbed at night?**

A. Practice rhythmical deep breathing, and count the breaths from one to one hundred. You will probably fall asleep before you reach one hundred.

Proper Position in Sleeping

Q. **Should one sleep upon the back or upon the side?**

A. The best position for sleeping is that in which one finds himself most comfortable. It is known that lying upon the right side favors emptying of the stomach. For persons who have very weak abdominal muscles and whose intestines are constantly filled with gas because of incompetency of the ileocecal valve it is a good plan to sleep upon the face. Sometimes it is still more beneficial to lie over a small cushion or pillow, the pressure of which upon the abdomen encourages bowel action.

Sleeping After Meals

Q. **Does sleeping after meals hinder digestion?**

A. On the whole, digestion interferes with sleep more than sleep interferes with digestion.

Six o'clock dinners are a very common cause of insomnia. A hearty meal should not be eaten within six or eight hours before retiring. Food is a nerve stimulant. The great influx of blood which occurs a few hours after eating a meal stimulates the brain and nerves and thus produces sleeplessness. The drowsiness which occurs immediately after eating is due to the fact that a large amount of blood is drawn to the stomach to aid the process of digestion. This lessens the blood supply of the brain and so produces drowsiness or dullness.

Dr. Schule, in carefully conducted experiments upon two subjects, showed that sleep during digestion greatly increases the acidity of the

gastric juice but hinders the passage of food from the stomach into the intestine. Simply resting in a horizontal position after eating, without sleeping, was observed to encourage digestion. These experiments clearly demonstrate the injury resulting from late suppers.

After Dinner Naps

Q. **Is there any objection to taking a nap after dinner or after any other hearty meal?**

A. Sleeping immediately after eating is decidely objectionable and often gives rise to hyperacidity. The stomach has two distinct lines of work:

1. It secretes a digestive fluid which dissolves food.

2. Its muscular walls contract upon the food, mixing the gastric contents and pushing the digested portion along to the intestine.

During sleep the secretion proceeds normally, but the movements of the stomach are greatly diminished in intensity so that the stomach is not emptied at the proper rate. This is partly due to the fact that the breathing movements are greatly diminished during sleep and so the assistance which the stomach receives from the diaphragm in moving food along into the intestine is lost. When the food is retained too long in the stomach the gastric contents become excessively acid, and the mucous membrane is injured and pain, spasm of the pylorus and other symptoms are the result. A short nap of ten or fifteen minutes after a meal is not objectionable, but prolonged sleeping directly after eating should be avoided.

Dreams

Q. **What is the cause of dreams?**

A. Dreams never occur in perfectly sound sleep. They are an indication that there is not complete cessation of activity in the cerebrum. The will being dormant, the various faculties act in an irregular, disorderly manner, giving rise to a great variety of absurd, grotesque, inconsistent mental pictures. It has been remarked that dreams are the best index to a person's character since they are really but the echoes of our waking thoughts. The superstitious confidence put in dreams is in the highest degree unphilosophical, and has not a shadow of evidence in its favor. Late eating and deficient physical exercise are the most common causes of bad dreams, which are also a symptom of disease.

The Sympathetic Nerves

Q. **What are the sympathetic nerves or the so-called sympathetic nervous system?**

A. This system is made up of a series of small ganglia found in the head and on either side of the spinal column within the cavities of the trunk. The ganglia are all connected by small fibres, so that they are sometimes spoken of as being a single nerve, the great sympathetic. Their fibres follow the blood-vessels in great numbers, starting with them as they go out from the heart. A large collection of sympathetic nerves found just back of the stomach, is known as the solar plexus. This system is closely connected with the cerebro-spinal system. It largely controls the functions of the heart, bloodvessels, stomach, liver and other vital organs.

Neuron

Q. **What is a neuron?**

A. A neuron or nerve cell is the unit of the nervous system of the body. It consists of three parts; a body, arms or branches known as "dendrites" and one very long arm called the "axon."

A nerve cell is strictly comparable to a small battery or a battery cell. In its body is generated nerve energy, much as a battery cell or a dynamo generates electricity. The axon conducts the nerve energy as a wire conducts electricity. The dendrites are receiving organs, like the antennae of the wireless apparatus. The dendrites of one cell form contacts with one or more axons of other cells. A nerve cell is also comparable to a central telephone station; it both receives and sends out messages. It differs from a telephone station essentially in the fact that while it may receive messages from many directions through its numerous branching dendrites, it has but one wire on which to send out its messages. But this one wire may make contacts with many different cells.

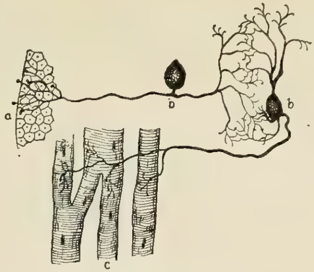
Nerve Energy

Q. **What is nerve energy?**

A. The energy generated by nerve cells was once supposed to be identical with electricity, but it is now known that this is not true. Nerve energy travels much more slowly than does electricity. The rate at which a nerve impulse travels is only about one hundred feet a second, whereas electricity travels at the rate of 280,000 miles a second.

Nerve energy differs from electricity in an-

A NEURON,
OR NERVE - CELL



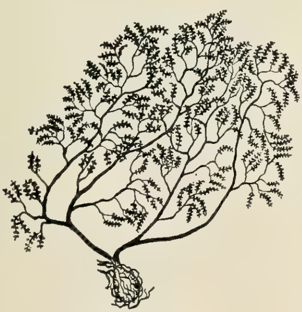
(a) SKIN
(b b) NERVE-CELLS
(c) MUSCLE

NORMAL NERVE-CELL SHOWING POINTS OF CONTACT

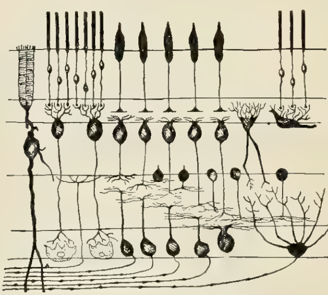
NERVE-CELL IN ACUTE
ALCOHOLISM

APPAEARANCE OF NERVE-CELL
IN CHRONIC ALCOHOLISM.

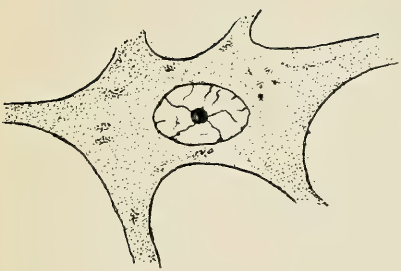
CONTRACTED
NERVE-CELLS.
CONTACT BROKEN



A PURKINJE'S CELL

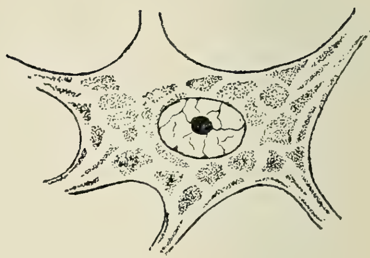


NERVE-CELLS OF THE RETINA



A

A, Rested Cell showing energy granules.



B

B, Fatigued Cell, energy granules diminished

other important particular. Electricity will travel on any moist or metallic substance. Nerve force will travel on nothing but nerves—axons or neurons. If a nerve is cut, the current of nerve energy is at once interrupted and is not restored, even if the ends are pressed together ever so closely. The nerve conductor is restored only by actual repair and restoration of the continuity of the living conducting path. Electricity, on the other hand, requires only a good contact to insure conduction.

When examined under a microscope, a healthy nerve cell is seen to contain a number of minute, glistening granules. Certain coloring matters are readily taken up by these granules so that they may be made easily visible under the microscope and thus their number readily estimated. Professor Hodge, an eminent physiologist, has demonstrated by a minute study of the nerve cells of swallows that there is a great loss of cell substance after the bird has been for hours active on the wing. These observations, with numerous others, have definitely proved that the granules represent stored energy.

Mental energy, like nerve energy, of which it is only one form, depends upon the energy granules stored up in the cells.

Mental capacity depends upon the number of brain cells and the number of groupings formed by connecting or so-called "association" fibres.

Fatigue

Q. **What is fatigue?**

A. A cell through its activity consumes itself, just as a battery uses up the elements of which it is composed. The exhausted cell is diminished in size and it has a much smaller number of energy granules than does the rested cell.

The nerve cell which has used up its store of energy so that its output is very small, or has ceased altogether, is in a state of partial or complete exhaustion.

When fatigue is the result of work, rest is demanded. If one continues to work when tired a wasteful expenditure of energy occurs. L. Zuntz, of Berlin, has shown that when one is fatigued the amount of energy required for the performance of a given task is greatly increased. For example, if one walking at the rate of three miles an hour expends seventy-five units of energy for each mile when fresh, after walking for some time and becoming weary, the energy expended per mile will be ninety calories or even more. The explanation of this increased energy expenditure is found in the fact that when one becomes tired he uses a larger number of muscles for performing the same work than when fresh.

Fatigue Poisons

Q. **What are fatigue poisons?**

A. Laboratory experiments have demonstrated that an exhausted muscle may be completely rested by simply washing it, showing that the exhausted muscle contains some element the removal of which restores the ability of the muscle to work. It has been noted, also, that

if the muscles of the legs are worked to the extent of exhaustion the arms also become tired, even though they have taken no part in the work. Professor Ranke found that an extract prepared from exhausted frog muscles produced fatigue when introduced into the circulation of fresh muscles. These experiments have led to the conclusion that poisons result from the activities of the cell. These fatigue poisons lessen the cell's working power.

Neurasthenic Fatigue

Q. **What is the most common cause of fatigue?**

A. There are two forms of fatigue.

1. The natural feeling of weariness or exhaustion which results from long work or activity.

2. A sense of exhaustion or "good for nothingness" which is not the result of work and is not relieved by rest—a very common symptom of neurasthenia. Natural fatigue is an acute condition but "the tired feeling" of the neurasthenic is a chronic condition and an unnatural state which no amount of rest will cure. Both forms of fatigue are due to poisoning. There is in the brain a nerve center known as the fatigue center. When work is done poisons accumulate in the tissues and when the poisons have accumulated to a sufficient degree they excite the fatigue center and thus call attention to the fact that the body requires rest. These products are known as fatigue poisons.

Proper rest, especially if accompanied by sleep, quickly relieves fatigue by giving the blood

an opportunity to wash poisons out of the tissues and for the liver and kidneys to destroy and remove them. The poisons that give rise to chronic fatigue are the result of the putrefaction of undigested and unused foodstuffs in the colon, and particularly undigested remnants of flesh food. This is why a person feels languid and tired when constipated, even when he has not worked. It is also the cause of the great exhaustion and weakness in a person suffering from diarrhea or looseness of the bowels. Neurasthenics are often continually tired, frequently to the point of exhaustion, when they have done no work. In such cases the fatigue is due to the poisons resulting from chronic colitis or other infections of the colon. Doctor Lee, of New York, showed that indol and skatol, the poisons which give to fecal matters their offensive odor, are powerful fatigue poisons.

Constipation is a much more common cause of fatigue than is over work. Neurasthenic business men imagine that they are being worn out by business cares and labors, because they are tired; whereas the real cause of their exhaustion is an overloaded condition of the colon. The temporary relief which such persons often seek in periodical visits to mineral water resorts is due to the laxative effects of the waters which temporarily unload from their bodies the poisons with which their tissues are saturated. This relief is only temporary however, for the use of mineral waters sooner or later results in colitis and an aggravation of the troubles for which relief is sought.

The bowels must be made to move regularly

three or four times a day by the use of agar-agar, bran preparations or paraffin. The free use of meat is a common cause of after dinner fatigue.

Many business men are unable to perform work of any kind after eating a hearty meal. A member of the Supreme bench of a western state, who had for several years been unable to do mental work for several hours after his midday meal, discovered after discarding flesh foods that he was able to work as easily and efficiently after dinner as in the morning. A prominent surgeon of the writer's acquaintance who had been unable to do any sort of professional work for several hours after his midday meal, after taking for the first time a dinner from which meat was excluded remarked: "There is something very remarkable about that dinner. I ate heartily but I feel just as well as I did before dinner and just as fit for work." This busy surgeon was so delighted with the discovery of a means by which his working capacity might be doubled that he discarded flesh meats of all sorts at once and has been a flesh abstainer ever since. He declared that he experienced so great an increase in capacity for work and general sense of well being that he feels quite like another man. The writer easily might cite hundreds of similiar instances.

A short hot bath is one of the most efficient means of relieving a sense of fatigue, whether produced by exhausting work, or the result of chronic toxemia or neurasthenia. The bath must be short however, not more than two or three minutes, and should be followed by a dash over the body with cool or tepid water. Very cold

water should never be used in conditions of fatigue for the reason that the expenditure of nervous energy required to produce reaction is absent, and reaction is likely to fail. Prolonged cold applications will still further exhaust the enfeebled nerve centers.

Heat and Fatigue

Q. **Is heat the cause of fatigue?**

A. A condition which closely resembles fatigue is the depression which results from excessive heat. The direct effect of heat upon living cells is stimulation. Heat, like cold, is an excitant, but the effect upon the nervous system of an overheated atmosphere, or a prolonged hot bath, is highly depressing.

Neuritis

Q. **What is the cause and the best remedy for neuritis?**

A. Neuritis is produced from many causes. A bruise or exposure to cold may produce inflammation of a nerve. The most common cause is poisons absorbed from the colon, which may give rise to so-called inflammation of a nerve which may become chronic. Another cause is focal infection, often diseased teeth or tonsils.

Most of the cases of so-called neuritis are really cases of neuralgia due to autointoxication.

The most valuable of all remedies is heat. Heat kills pain. Very hot fomentations (see index) should be given morning and night, or better still, three times a day. Care should be taken to avoid exposure of the affected parts to cold which greatly aggravates pain.

The electric light bath and other hot baths are beneficial, but must not be too prolonged as they may produce a depressing effect. Acute neuritis requires rest. Chronic neuritis is benefited by exercise and massage. In this respect neuritis differs from rheumatism. Rheumatism requires rest of the affected parts. The increased movement of the blood resulting from exercise is highly beneficial in neuritis. The cause of neuritis should be combated by discarding tobacco, if this drug is used, and tea, coffee, condiments and poisons of all sorts. Meats of all kinds must be disused, not only because of the poisons which they contain but because of the poisons which result from the putrefaction of the undigested remnants of flesh foods remaining in the colon. The flora must be changed and the bowels must be made to move three or four times a day by the free use of bran or bran preparations or agar-agar and paraffin.

Defects of Speech

Q. What are the common defects of speech and what are the causes?

A. The most prominent forms of defective speech are paralalia and dyslalia. Paralalia is a term applied to the various forms of defective speech and erroneous pronunciation, sometimes called stammering. The most common of these defects are the following:

Lalling, in which the sound of *l* takes the place of many other consonants.

Lambdacism, in which there is inability to pronounce the consonant *l*, *r* or *w* being substituted for *l* in words in which this consonant occurs.

The Japanese have no *l* in their language and often show this defect of speech in their attempts to use English words.

Gammacism, in which the letters *t* or *d* are used in place of *g* or *k*. This defect is due to lack of mobility of the back part of the tongue.

Rhinism, in which words are uttered with a "nasal twang" due to complete or partial paralysis of the soft palate or obstruction to the nasal passages.

Rhotacism, in which there is a defect of pronunciation of the letter *r*. The letter *r* is absent from the Chinese alphabet. Consequently they substitute *l* for *r* when speaking other languages than their own. English snobs show this defect in substituting *w* for *r* as "wubber" for "rubber."

Sigmatism or lisping, a defect shown in various ways in the pronunciation of the letter *s* and cognate sounds. The most common is the substitution of the sound *th* for *s* or the reverse.

In most of these defects the fault is with the tongue, the difficulty being lack of mobility or faulty action. Notwithstanding this fact it is known that removal of the tongue does not necessarily prevent speech.

Dislomia is a form of defective speech in which there is spasm which may be so slight as to produce a hesitancy in speech or may give rise to a repetition of syllables as tut-tut-tut--tut-tut-tut-, or may, if very strong to cause utterance to cease entirely. There are three forms of dislomia. First, hesitating speech; second, clonic spasm of articulation in which there is repeated utterance of a letter or syllable before the next

can be uttered; third, tonic spasm of articulation, commonly called stammering, in which speech is interrupted, the organs of speech being made immovable by spasm.

Most cases of disorder of speech may be cured by careful training. Various tricks are used by charlatans, for teaching which enormous sums are often charged. Some of these tricks have for their purpose to inspire the confidence of the stammerer in his ability to speak, which really often overcomes the major part of the difficulty; in fact, stuttering and stammering are often the result of the voluntary interference with a function which is normally automatic. The harder the individual tries to speak, naturally the more difficult he finds the effort, when if the mind is diverted so that he speaks involuntarily and without self-consciousness there is no difficulty. Most stammerers are able to sing as well as other people. Among the various tricks which are employed, and all of which are more or less helpful in individual cases, are the following:

(a) Make a movement with the finger or foot at every syllable spoken. The rhythmic action apparently overcomes the spasm in many cases.

(b) Breathe deeply and nod the head while speaking and practice deep breathing.

One "secret," which was sold at a high price, consisted of the notion that the human mind is capable of containing, at the same time, one thought and a half, and that the half thought, which is just coming into the mind, interferes with the expression of the thought already well developed in the mind in speech. The cure con-

sisted in banishing the half thought. This was supposed to be accomplished by jingling a watch chain, striking the hips, or performing some other slight movement.

(d) Other common tricks consist of pressing on the chin with the thumb, speaking with bullets or buttons in the mouth, or with a cork between the teeth. An old trick, suggested by Dr. Arnott, consists in prefixing all initial consonant sounds with the short sound of *e* and substituting for the initial *w* the sound of *oo,* for *y, ee,* and for *u, eeoo.*. The following illustration will show how this idea would be appied to a sentence. For example:

"Would you willingly aid in securing unanimous consent to the robbing of medical practitioners by taxation?" Should be pronounced thus:—

"Ooould eeoo ooillingly aid ins-ec-uring eeoonanimous ĕc-ons-ent ĕto ther-obbing ofmedical ĕpract-itioners ĕbyt-axation?

All these tricks may be tried, and in addition the general health should be improved by careful attention to bygiene in every possible way. Deep, steady breathing should be practiced several times daily. For a bad stammerer the best plan is to place himself under a good trainer, but by all means avoid advertising charlatans. Persons who claim to have secret methods should be carefully avoided.

Remedy for Flushed Face

Q. **What will relieve flushing of the face?**

A. An antitoxic diet; that is, a diet in which meat is entirely excluded, including fish and fowl and an increase of bowel activity. The bowels should move three times a day. Bathe the face with very hot water.

Hot Flashes

Q. **What can be done for hot flashes?**

A. Hot flashes are due to a disturbance of the sympathetic nervous system.

The best measures of treatment are an outdoor life and improvement of the general health. Special attention should be given to the bowels which should be made to move three or four times a day by regulation of the diet and the use of simple measures, such as agar-agar and bran and some good preparation of paraffin. A neutral bath taken at night often proves very valuable. The temperature of the bath should be 96° to 92° F. and the duration from thirty to forty minutes. Take every morning a cold towel rub. If thin in flesh, try to gain in weight by increasing the amount of starchy food and fat in the diet.

Neurasthenic Gait

Q. **Is a person suffering from neurasthenia in danger of becoming afflicted with locomotor ataxia?**

A. No. The incoordination, or the unsteadiness of gait, sometimes observed in neurasthenia is due to weakness of the nerve centers, and disappears with recovery of strength.

Neurasthenia Not a Disease

Q. **Is neurasthenia a distinct disease?**

A. It is not really a distinct malady in the sense that typhoid fever, small pox, pulmonary tuberculosis and pneumonia are diseases, but is rather a symptom or group of symptoms resulting from disease. Or, to speak more accurately, it is a group of symptoms that are not connected with a definite morbid condition, but that may accompany various morbid states—just as fever with its accompanying headache, rapid pulse, high temperature, hot skin and prostration is not a disease, but rather an indication of the presence of disease, the character and seat of which may vary greatly.

Neurasthenia is simply a state of exhaustion of the vital resources, the result of neglecting to conform to the great biologic laws which have control over the functions of the mind and body.

Cause of Neurasthenia

Q. **What is the cause of neurasthenia?**

A. Neurasthenia is generally attributed to over work. In the writer's experience cases of neurasthenia due to over work are extremely rare. Indeed the author does not feel certain that he has ever encountered a case of this sort. It is not over work, but over civilization and useless waste of energy in worry and in other ways that produce neurasthenia. Work is physiological. The damages that result from work, even from over work, are readily repaired by rest and sleep, Nature's efficient remedies for the consequences of over-activity.

Every tired person is for the time being neurasthenic. His store of nerve energy is exhausted, his efficiency is impaired; but a period of rest, with a few hours' sleep, completely restores him to his normal state. This is true of a healthy man; but a neurasthenic is tired when he has not worked, perhaps even feels worse after he has slept. So it is plain that the neurasthenic is suffering from something more than over work. His fatigue is not of a sort that is cured by rest or sleep. He is chronically tired from the absorption of colon poisons.

Neurasthenia of Sedentary Persons

Q. **Does neurasthenia especially affect sedentary persons?**

A. Among 604 neurasthenics there were found:—

Merchants and manufacturers	198
Clerks	130
Professors and teachers	68
Students	50
Officers	38
Artists	33
Without profession	19
Medical men	17
Agriculturalists	17
Clergy	10
Men of science and learning	6
Schoolboys	6
Working men	6

That muscular work, even excessive, is not a common cause of neurasthenia is clearly shown by clinical experience. The above table shows

only one neurasthenic from the working class to more than a hundred from men leading sedentary lives.

Can One Inherit Neurasthenia

Q. **Is neurasthenia an inherited condition?**

A. Neurasthenia is not hereditary, but an increasingly large proportion of the population is born with a predisposition to neurasthenia and other neuroses. This predisposition is, of course, not curable. It is a personal characteristic as definite and ineradicable as the color of the hair or the eyes; but if the predisposition cannot be removed, its outward manifestations may be indefinitely postponed or altogether prevented. Probably most neurasthenics are born with a predisposition to the disease, although it is also probable that any person may become a neurasthenic if the exciting causes of this condition are applied with sufficient intensity and for a sufficient length of time.

Neurasthenia in Children

Q. **Do children suffer from neurasthenia?**

A. Neurasthenia often begins in childhood. Multitudes of children are made neurasthenic by wrong methods in education, especially by the neglect of physical development, and by improper discipline in the school or in the home. Doubtless most of these young neurathenics are predisposed to neuroses by heredity. The proportion of such children to the total school population is unquestionably increasing.

In a school numbering six hundred pupils, thirty per cent showed symptoms of neurasthenia, such as persistent headache, insomnia, palpitation, sudden neuralgic pains, etc.

A very significant fact is the increase of the proportion of neurasthenics with each advancing grade. In the classes of a secondary school the following proportion of neurasthenic children were found in the several grades:

Preparatory class	8 per cent
First class	15 per cent
Second class	22 per cent
Third class	28 per cent
Fourth class	44 per cent
Fifth class	47 per cent
Sixth class	58 per cent
Seventh class	64 per cent
Eighth class	89 per cent

Causes of Headache

Q. **What are the usual causes of headache?**

A. Among the most common types of headache are:

1. Neurasthenic headache.

This headache is not a sharp pain but a pressure at the back or top of the head, often described as a band about the head.

2. "Sinus" headache; a form of headache generally located just above the eyes and due to a diseased condition of some of the sinuses connected with the nose.

3. Rheumatic headache; due to the absorption of pus from some focus of infection which may be the tonsils, teeth, suppurating ear, or a diseased colon.

4. Nervous or migraine headache; sometimes called sick headache due to toxins absorbed from the colon and always associated with intestinal stasis or constipation.

Nervous Headache—Migraine—Bilious Headache

Q. **What is the cause of nervous headache?**

A. The so-called nervous headache is not an affection of the nerves but a sign of toxemia. This is certainly true in the great majority of cases, if indeed there are exceptions to the rule. The ordinary cause of headache is the absorption into the system of poisons due to stagnation in some part of the intestines, resulting in absorption of poisonous matter generated by the putrefaction of the delayed fecal material. In many cases the stasis or stagnation occurs in the upper part of the colon or cecum. X-ray examinations show in practically all cases of chronic nervous headache incompetency of the ileocecal valve; that is, the small intestine is no longer shut off from the large intestine, because of overstretching of the bowel. The opening at the junction of the small intestine with the colon is so greatly enlarged that the check-valve which normally exists at this point is rendered inoperative so that the putrefying fecal matters found in the colon back up into the small intestine. So long as the poisonous materials remain in the colon comparatively little harm is done for the reason that the mucous membrane of the colon appears to act as a very efficient filter, holding back the poisonous matters which are present in the colon contents, and permitting absorption only of water and harmless substances. The small intestine is not so well prepared and at the same time absorbs with very great rapidity. The small intestine for example, absorbs five or six quarts of liquid every twenty-four hours and the greater

part of this absorption takes place in the lower part of the small intestine or the part adjacent to the colon. The colon absorbs only a few ounces of liquid each twenty-four hours. The constant presence of incompetency of the ileocecal valve in cases of nervous headache or migraine gives good ground to suspect that this defect is one of the important causes of this distressing malady. Sufferers from this disease are also chronically constipated, or experience alternations of diarrhoea and constipation.

Bouchard was one of the first to call attention to the relation of migraine to intestinal toxemia, and he stated:

"I believe that nine-tenths of the migraines are of dyspeptic origin, produced by a primary intestinal intoxication. The effect may be made to disappear by the administration of caffein or antipyrin, but the cause remains. The patient feels his pains immediately lessen, but they rarely disappear entirely; often they reappear more violently than ever. But what we must endeavor to do is to prevent a return of this crisis, and to secure this it is necessary that all putrid fermentation be expunged from the intestinal canal during digestion. If we can make the dyspepsia disappear, we heal the migraine."

Treatment of Migraine

Q. **What is the best treatment of migraine?**

A. Recent observations indicate that migraine in many cases is due to anaphylaxis. In many instances the attacks are due to the absorption of protein; the protein of milk and eggs seems especially likely to produce an attack.

Of greatest importance is particular attention to the bowels, which should be made to move freely at least two or three times a day. It is the usual experience of sufferers from migraine that an attack is preceded by constipation. In cases in which this symptom is not observed, a sluggish state of the bowels probably exists, although not apparent to the patient. Administration of an enema in such cases generally leads to the discovery that the cecum is filled with decomposing food remnants, which have been retained for some days in this dilated portion of the colon. The free use of fruit is a matter of very great consequence in migraine, and an exclusive fruit diet will almost certainly secure complete relief from suffering so long as it is maintained; but of course such a diet cannot be continued indefinitely, though the disease can be greatly benefited.

Migraine is now generally recognized as one of the symptoms of intestinal autointoxication. Poisons absorbed from the intestine circulate in the blood and are excreted in the stomach, giving rise to nausea, gastric irritation, nervous exhaustion and other general symptoms as well as local pain. Where an attack of migraine is threatened, a repeated enema should be administered, and in many cases the attack can be shortened by some quickly-acting laxative, as a seidlitz powder or a dose of sulphur.

Gastric lavage may also be administered with great advantage. Nearly always a considerable quantity of acrid material is found in the stomach even when no food has been taken, and after free vomiting. There is reason to believe that in

migraine poisonous substances absorbed from the colon are excreted into the stomach in considerable quantity and the resulting gastric irritation is one of the causes of the distressing symptoms experienced by the patient. The water employed in the gastric lavage should be at a temperature of about 105° F., at least not less than this. Great relief is generally experienced when the lavage is administered promptly at the very beginning of the attack.

Migraine is, without doubt, a result of erroneous habits of life. It is a malady which particularly effects sedentary persons, hence is found among professional people. The use of tea and coffee, the use of flesh foods or a high protein diet are unquestionably the great causes of migraine, and of course the disease will not be cured so long as these practices are continued.

Attacks of migraine, when once begun, cannot be abruptly stopped, although the patient's suffering may be greatly mitigated and the attack may be abbreviated. The time to cure an attack of migraine is before it begins, and this is true of headache in general. A thorough bowel movement three times a day, a careful adherence to an antitoxic diet, excluding eggs as well as meat, are most effective measures for combating "sick-headache."

Neuralgia

Q. **What is neuralgia? How may the pain be relieved?**

A. Neuralgia may be caused by mal-nutrition, impoverishment of the blood, an excess of protein in the diet, autointoxication through the

absorption from the colon of the products of putrefaction. An eminent French physician has stated that pain is the cry of a hungry nerve for better blood. The best way to secure better blood is to live an active outdoor life. Better blood is secured by careful regulation of the dietary, avoiding all irritant and poison-containing foods, by thorough mastication of food, and a sufficient amount of exercise daily in the open air to secure moderate perspiration; the cold bath every morning on rising, and an abundance of fresh air during the night secured by opening wide the windows of the bedroom or by sleeping outdoors.

For temporary relief heat is the best of all remedies. It cannot be too often repeated that heat kills pain. Applications of heat may be applied in a great variety of ways, as by hot fomentations (see index), hot water bags, hot sand bags, hot poultices, photophore, incandescent electric light, arc light and diathermy. The last named remedy is a modification of the wireless electricity and is especially useful in cases of deep seated neuralgia, visceral neuralgia, which cannot always be relieved by external hot applications. By means of diathermy heat may be supplied to any internal part, no matter how deeply seated. Three bowel movements daily, and a hot bath every night, and cold bath and vigorous friction every morning and careful adherence to simple life rules are effective remedies.

In making hot applications for relief of neuralgia it is important to remember that the water must be as hot as the patient can bear it. The application should be so hot as to make it

necessary to take it off and put it on two or three times, until the patient's skin can bear it a little better. Commencing the application at about 110° F., the skin will gradually acquire a tolerance for heat until a temperature from 140° to 160° F. can be borne. Facial neuralgia, neuralgia of the stomach, intestines, or bladder, lumbago, sciatica, in fact, almost any form of neuralgia, is relieved by the application of intense heat. It must be remembered also that the hot treatment is not to be continued indefinitely —fifteen or twenty minutes is sufficiently long, and it should be immediately followed by the application of a towel or compress wrung very dry from ice-water and left in place thirty seconds. The parts should then be covered with dry flannel, which will greatly prolong the effect of the hot application.

Tic Douloureux

Q. **What is the best treatment for tic douloureux, or trifacial neuralgia?**

A. In bad cases it is necessary to destroy the nerve by injecting alcohol into the nerve trunk. In some cases, the disease disappears if the bowels are made to move well three times a day, and the diet confined to fruits, grains, nuts and vegetables.

Prickling Sensations

Q. **What is the cause of prickling sensations?**

A. Hot flashes, cold sensations, prickling, smarting, "electric thrills" and a great variety of other perversions of sensations are experienced by certain classes of neurasthenics.

While all these symptoms are sometimes experienced by those suffering from organic nervous diseases, their occurrence in neurasthenia has no other significance than a disturbed circulation of the nerve trunks.

Shingles—Herpes Zoster

Q. **What causes shingles?**

A. This peculiar and very painful disease is due to inflammation of a nerve trunk believed to be the result of infection. The most common seat of the disease is the side. The eruption follows the course of an inter-costal nerve. A single nerve trunk of the leg or any other part of the body may be the seat of the inflammation. At the beginning of the disease very hot applications applied over the affected parts give the most relief.

If for example, the shingles affects the side, the most common seat, the fomentations (see index) should go two-thirds the way around the body, and should reach from the armpit to the hip. The affected part itself should be covered first with a little dry cotton or cheese cloth, and then by mackintosh or a piece of newspaper folded to three or four thicknesses. After the fomentations, rub the sound skin over the whole surface that has been reddened with the hand or a soft napkin dipped in very cold water. Continue the rubbing about half a minute, frequently dipping the hand in the cold water. Then dry the parts, and dust the inflamed surface with starch and cover with soft cotton or with a mass of soft cheese cloth. Apply a bandage around the body just tight enough to hold the cotton in place. This may be repeated

three or four times a day, and will afford very great relief; but the disease has a definite course the same as measles, whooping-cough, and many other diseases. After a few days the eruption will disappear.

The parts which have been inflamed are frequently the seat of disagreeable neuralgic pains for some weeks or even months after an attack. For this apply very hot fomentations three or four times a day and the heating compress during the interval and at night. The heating compress consists of a napkin or small towel wrung dry out of very cold water, and applied over the part, covered first with mackintosh, and then with flannels so as to keep it very warm.

Sciatica

Q. **What is sciatica and what is the best method of treatment for this condition?**

A. Sciatica is a painful affection of the sciatic nerve or large nerve which supplies the back part of the thigh and also the leg.

The pain and suffering caused by this disease is often most distressing. Fortunately it may generally be relieved.

A very hot bath is a most excellent remedy for relieving the pain of sciatica. The patient sits in an ordinary tub with the limbs extended and the water deep enough to reach the umbilicus. The temperature of the water is gradually raised until as hot as can possibly be borne. The duration of the bath should be two to ten minutes. At the end the temperature may be reduced to 80° F. for half a minute. The patient should be then put in bed and wrapped up

warmly. Hot fomentations (see index) over the painful parts, the arc light, photophore, thermophore, galvanism and massage are other measures which may be used advantageously. Sometimes sciatica is due to intestinal autointoxication.

Most persons suffering from sciatica are subjects of chronic constipation. One of the most effective measures of combating the disease is to change the intestinal flora and to secure normal bowel activity, that is, three or four full bowel movements daily. The patient should adopt permanently a strictly anti-toxic diet (see index). A person who suffers pain at the hip which does not rapidly yield to treatment should submit himself to examination by a competent x-ray specialist. Pain in this region is not infrequently due to sarcoma or some other form of malignant disease, or to tuberculosis.

How the Mind May Cause Disease

Q. **How does the mind affect the body in producing disease?**

A. Recent scientific experiments show that joy, sorrow, anger and fear, as well as other emotional states, are powerful forces which may exalt or depress bodily functions as quickly and as powerfully as the most potent drugs or the most active physical agents. Joyful emotions heighten the activity of all the bodily functions. Under the influence of joy the small arteries and capillaries dilate, and every organ receives an increased and more active blood supply. Through the influence of joy upon the muscular system there is not only an increased disposition to activity, but an increased capacity for

effort and endurance. The heart beats stronger, the brain thinks clearer, breathing is deeper, digestion more active, the eyes brighten, the cheeks glow—the whole body rejoices and prospers under the influence of a peaceful, contented and joyous mental state.

Sorrow produces a bodily condition quite the opposite of that produced by joy. Under the influence of sadness, all the bodily functions are depressed. The muscular system is relaxed and weakened. The sorrowful individual has the appearance of one who is exhausted or fatigued. The frequent sigh is simply Nature's effort to make up by deep breaths the loss of oxygen which results from the decreased activity of the chest. There is a physiologic basis for the current expression, "Weighted down with sorrow."

The effect of sorrow upon the internal organs is most profound. The external blood-vessels are contracted, causing pallor or sometimes a livid appearance, due to diminished circulation through the skin; the hands and feet are often cold, and the secretions are diminished.

Worry and Exhaustion

Q. **Why does worry cause exhaustion and depression?**

A. Worry is a sort of mental short-circuiting which rapidly exhausts the nerve centers, draining them of their energy and unfitting the body for useful effort. Experiments have demonstrated that depressing emotions are far more powerful causes of wear and tear to nerve centers than is healthy brain work. According to Mosso's observations, the effect of vigorous

intellectual activity upon the brain is far less than that of a disturbing emotion. Mental work, combined with worry and anxiety, tears down the nerve centers, exhausts their stores of energy, and cripples their ability to recuperate; but it is not the work itself which does the mischief; it is the cross-fire, the short circuit, the confusing and harassing influence of disturbing emotions, which exhaust the nerve forces and prevent the brain from repairing its losses.

Mental Healing

Q. **Is "mental healing" possible?**

A. The success of various classes of mind healers with certain invalids affords most convincing evidence that a large number of persons suffer from maladies which have their chief seat in a morbid imagination or a wrong mental attitude. Thousands of neurasthenics are made miserable by depressing symptoms which are the outgrowth of a disordered state of the nervous system, and which have no organic foundation. Morbid sensations which are distressing and even highly painful in these patients not infrequently disappear instantly when some happy circumstance produces a favorable change in the patient's state of mind. On the other hand, an unfavorable mental change may bring about at once an aggravation of symptoms present or may induce a wholly new crop of unpleasant sensations. Every physician of experience has encountered such cases.

How to Cure Worry

Q. **How can one overcome a disposition to worry?**

A. The man who worries because of the threatened collapse of an important business enterprise, to the building up of which his whole life has been devoted, may not be relieved until the threatened danger is averted or the crisis passed. The man who is suffering from physical deterioration, because of chronic toxemia, must be renovated physically. Poison habits must be abandoned. A natural antitoxic dietary must be substituted for his customary poison-laden bill of fare. The bowels must, by natural means, be made to move three or four times a day, thus ridding the body of the influence of worry-producing poisons. There must be a complete revolution in living habits, and a thoroughgoing adoption of simple-life principles of living. By this means a general physical regeneration may be produced, with the development of which the disposition to worry will gradually disappear as the cause is removed, until finally a normal, happy mental state is established.

Diversion is one of the most valuable remedies for worry. Concentration of the attention upon some wholesome subject is of utmost importance as a means of combating worry, whether due to present physical or mental causes or merely habit. Constant occupation of some sort is essential as an aid to diversion. Manual work is best.

Injury from Night Noises

Q. **Are night noises injurious if one is able to sleep in spite of them?**

A. That noise may be a cause of disease is no longer questioned by pathologists. Certain persons get used to noises, no matter of what sort, when long exposed to them, and seem to suffer no injury; but even these persons are being damaged more or less by the constant hammering upon their nerve centers through the auditory nerves. Nerve centers need rest quite as much as do muscles.

Sound, restful sleep in the presence of noise is impossible. A person who lives in the midst of noise gets no really complete rest day or night; asleep or awake, the nerve centers are constantly receiving a torrent of irritating impulses. This incessant nerve nagging gives no opportunity for recuperative rest.

Fear

Q. **Is there any relation between fear and disease?**

A. There is no doubt that fear, worry and other depressing emotions—anxiety, sorrow, apprehension, pain and suspense are active causes in producing disease. Doctor Jensen, an eminent London physician, by careful analysis of the symptoms resulting from these depressing emotions, has discovered that their effects are similar to those resulting from severe surgical shock. The blood vessels of the intestines become paralyzed, the blood accumulates in these parts, robbing the brain and other vital organs of their natural blood supply and so producing

mental inefficiency, shortness of breath and a general condition resembling fatigue. This distension of the blood vessels of the intestine encourages the absorption of the poisons generated in the intestine, while at the same time increasing the production of poisons by impairing the digestive functions. The extreme dryness of the mouth which usually accompanies a state of fear is strong evidence of the correctness of Doctor Jensen's theory, being due to the fact that the general tissues of the body including the salivary glands are robbed of their normal blood supply and drained of their fluids which are accumulated to an extraordinary degree in the abdominal organs. This theory accounts for the well-known fact that the milk of a nursing woman is made poisonous to the infant by an outburst of anger or a severe fright.

The fact that fear and other depressing emotions produce these physical changes in the body emphasizes the great importance of eliminating this cause of disease and especially in the protection of sick persons against its malignant influence by optimistic suggestion and through encouragement and cheerful surroundings.

Prolapsed Stomach and Bowels

Q. **Does prolapse of the stomach and bowels produce neurasthenia?**

A. Weakness of the trunk muscles, resulting in a sagging of the abdominal wall and a prolapse of the viscera, must be regarded as one of the causes of gastric or splanchnic neurasthenia —one of the most common results of a sedentary life. The deforming bulge of the lower ab-

domen is most commonly seen in persons of sedentary habits. It is most common in women, but professional men of all classes very frequently present the same ungainly shape of body and suffer from the natural consequence—splanchnic engorgement and visceral neurasthenia.

Many cases of neurasthenia may be promptly relieved by the application of a suitable abdominal supporter. The supporter shown in the accompanying cut has been successfully used in many hundreds of cases of this sort.

Treatment of the Narcotic Habit

Q. **What is the best way to get rid of a narcotic habit?**

A. The best means of ridding oneself of the alcohol, tea, coffee, or tobacco habit is to adopt a dry dietary, making free use of fruits and fruit juices and to practice thorough mastication.

Flesh foods and all animal broths and extracts unquestionably excite the nerves, and create a demand for the soothing effect of a narcotic. Hence a person who desires to free himself from the alcohol, the tobacco or the tea or coffee habit must first of all dispense with all flesh foods. Condiments must also be discarded, as these irritate and excite the nerves, creating a desire for the soothing effects of some narcotic drug.

The nervousness and irritability which follows the withdrawal of the accustomed drug may be wonderfully relieved by the prolonged neutral bath at a temperature of 94° to 96° F. The duration of the bath may be indefinite; several hours if necessary. If there is palpitation of the

heart, or rapid pulse with a feeling of distress through the chest, this may be relieved by the application of an ice bag over the heart, by sponging the spine alternately with hot and cold water, or applying first hot and then cold compresses to the spine, alternating every minute.

Baths for the Insane

Q. **Can insanity be cured by baths and diet?**

A. Certain forms of insanity are greatly benefited by the proper baths. This is particularly true of melancholia and mania. Acute forms of insanity generally recover under careful treatment, including baths, proper regulation of the diet, etc. Baths are now administered in all well-organized insane asylums.

The prolonged neutral bath is of special value in the treatment of insanity. In a case of acute mania the neutral bath is superior to all remedies as a means of producing sleep.

The patient is placed in the bath suspended in a hammock and is kept in the bath until he becomes quiet. At first a very prolonged application may be necessary; two or three or even ten or twelve hours, but the patient sooner or later becomes quiet and falls into a refreshing sleep. The neutral bath is now recognized as the most valuable of all means to promote recovery in these cases. The shower bath and douche, both hot and cold, are also highly useful measures in various forms of insanity. At the present time drugs are very little used in the treatment of insane patients. In the New York State Hospital for the insane the electric light bath, the shower

bath and the neutral bath are the principal measures of treatment employed and are found to be so effective that drugs of all sorts have almost fallen into disuse.

Locomotor Ataxia

Q. **What is the cause of locomotor ataxia?**

A. The most common cause is syphilis. It is one of the late manifestations of infection of the body with the spirochete, the parasite to which the disease known as syphilis is due. It is barely possible that locomotor ataxia may be due to some other causes, but it is the general belief among physicians that this malady is rarely, if ever, attributable to any cause other than syphilitic infection. Syphilitic infection contracted in youth is likely to be followed twenty or thirty years later by tabes dorsalis or locomotor ataxia. The infection may be inherited.

Mind Blindness

Q. **What is meant by mind blindness?**

A. Mind blindness is a condition in which, although a person's eyesight is perfect, he is still unable to see. The eye and the optic nerve perform their function properly, but the nerve center in the brain in which are stored the memories of sight no longer performs its function and so the object is not recognized, although it may be a most familiar one. Mind blindness may be related to various objects or only to words. In some rare cases the mind blindness may relate to words of one language only, while words of another language may be recognized promptly. This

condition is due to an injury to a small portion of brain substance found near the anterior portion of the left side of the brain. Recovery sometimes occurs, although the injury is often permanent.

Morning Depression

Q. **What is good for morning depression?**

A. A cold morning bath, properly administered, is a complete antidote for the morning depression experienced by many neurasthenics. It is of the highest importance, however, that the bath should be taken in a proper way. The average neurasthenic would be little likely to receive benefit from a plunge into a tub filled with cold water. Such a bath would likely be followed by an aggravation of symptoms, increased pain, increased depression, increased disturbances of circulation, as shown by cold hands and feet, etc. A single trial would be sufficient to discourage further efforts in the direction of cold bathing. Neurasthenics are generally highly sensitive to the effects of cold water on this account it is necessary to avoid very cold general applications. A temperature of 80 degrees is often as low as can be tolerated at first. The temperature may be gradually lowered as the ability to react improves. In many cases a cold air bath, that is exposure of the skin to cold air, while rubbing vigorously with a towel, is better than the cold water bath.

Epilepsy

Q. **What is the cause of epilepsy?**

A. The most eminent nerve specialists are now agreed that in the majority of cases epilepsy is due to bad heredity or constitutional defect of

some sort. It is hence evident that for a radical cure the treatment of an epileptic must begin before he is born. The inherent defect which manifests itself in epilepsy may be inherited from either the father or the mother. Alcohol, syphilis, lead poisoning and probably many other infections may so impair the germ plasm of the parents or injure the developing embryo as to give rise to epilepsy. There are, of course, cases in which the disease is due to the growth of a tumor in the brain. These cases are comparatively rare. In the majority of cases of epilepsy, according to Dr. Williams, former superintendent of the State Epileptic Institution of New Jersey, the family history shows epilepsy if not in the parents, in an uncle, aunt, cousin, or some other near relative. Dr. Williams insists that children born in families with an epileptic heredity should be placed under special treatment and training before the active symptoms of the disease develop. Dr. Derkum of Philadelphia, one of the leading nerve specialists of the United States, insists that the best remedy for epilepsy is the simple life, what he terms, "the back-to-Nature cure." Out of door life, abundant exercise in the open air, simple non-stimulating food, general health culture—these are the most effective means recognized to combat this grave disease.

When the laws of eugenics come to be better understood and their bearing upon race welfare better appreciated, no doubt legal restrictions will be placed upon the marriage of epileptics as a most effective means of preventing the increase of defectives of this class.

Muscle Tone

Q. What is meant by the term "muscle tone"?

A. The living muscle is always at work. The controlling centers continually send out a rhythmic stream of impulses whereby the muscle is kept constantly in a state of tension. This is muscle tone. When the nerve centers are full of energy and the muscles are in a healthy state, muscle tone is good; that is, strong impulses are sent into the muscles, and the result is strong muscular tension. In certain conditions of disease when irritation of muscles or nerve centers exists, either as the result of the direct effect of diseased conditions or of reflex influence, tension may be enormously exaggerated, as may be seen, for example, in torticollis, writer's cramp, hysteria and in the tensed condition of the abdominal muscles accompanying disease of the appendix or inflammation of the gall bladder. Imperfectly developed muscles are deficient in tone.

Unused muscles rapidly lose their normal tone. Overstrained muscles become relaxed, which is also true of muscles controlled by exhausted nerve centers.

Exhaustion from Nerve Tension

Q. Why does a person whose nerve tension is high become easily exhausted?

A. Because of the great waste of nervous energy. From 30 to 50 per cent of all the energy expended by a person in a state of rest is used up in maintaining the muscle tonus of the muscles. This muscle tonus is the principal means of main-

taining the heat of the body. It is enormously increased when the body is exposed to cold, for the purpose of making good the loss of heat. When the exposure is such that the temperature of the blood and the body is reduced a fraction of a degree the muscle tonus is increased so greatly that actual shivering may occur. The same increase of nerve tension, which may amount even to trembling of the hands and of the whole body, may result from extreme nerve tension due to nervousness or some strong emotion as fear or anger. Under these conditions the expenditure of energy is enormously increased, and may amount to several times the normal rate of energy loss from this cause. A person who is constantly in a state of nerve tension may, through this cause alone, lose more energy than is made good by the daily intake of food. Such a person will lose flesh and will be constanty in a state of exhaustion because of the great waste of energy.

The rest cure is of very great value in such cases. Rest in bed for two or three weeks, with proper feeding, generally proves of very great service in cases of this sort. The patient should be protected from all possible sources of mental worry and anxiety.

Muscular Co-ordination

Q. **What is meant by muscular co-ordination?**

A. The coördination of muscular movement is one of the results of training which is secured through the use of the muscular sense.

Co-ordination denotes the association of various muscles in performing work, particularly such

complicated acts as writing, walking or piano playing. A man who has lost the power of co-ordination in the legs, staggers when he walks. This is the cause of staggering in a drunken man or a man suffering from locomotor ataxia. Neurasthenics sometimes show this symptom slightly, especially in the hands. Inability to stand with the eyes closed is a test for inco-ordination.

The loss of the muscle sense in locomotor ataxia leads to inco-ordination. It may be redeveloped by training, which is of great importance in the treatment of locomotor ataxia and other conditions in which this function is disturbed. Every new association of muscles must be learned and perfected by repeated effort. These efforts are at first painful and exhausting, as for example in walking a crack or narrow plank. Writing, piano-playing, typewriting and similar movements at first very quickly produce fatigue, hence should not be continued too long at a time.

Tea Taster's Disorder

Q. **What are the symptoms of chronic tea taster's disorder?**

A. An eminent New York neurologist gave the following description of the symptoms presented by a tea taster:

"Headache is frequent, principally frontal and vertical; a ringing and buzzing in the ears is very constant; black spots often flit before the eyes, and he sees flashes of light. Vertigo also is very persistently present; he cannot look up at a clock on a steeple without staggering; insomnia exists to a considerable extent; he seldom has a good night's sleep, and he dreams much,

but his dreams are of a pleasant character; he sometimes sees visions when not sleeping. Dyspepsia is more troublesome than any of the foregoing three symptoms. This, the patient assigns strictly to tea-tasting, since it is made worse by tea, and improves when he abstains from it, though now becoming confirmed. His appetite is captious, he feels heavy at the epigastrium, he has eructations and sour taste, and finds that certain kinds of food distress him. He has a frequent gurgling, and is in the habit of 'working' his whole chest and abdomen to make the gas pass on.

"His mental condition is peculiar. He lives in a state of dread that some accident may happen to him; in the omnibus, fears a collision; crossing the street, fears that he will be crushed by passing teams; walking on the sidewalks, fears that a brick wall may fall down and kill him; under the apprehension that every dog he meets is going to bite the calves of his legs, he carries an umbrella in all weather, as a defense against such an attack. He often dreads entering his office for fear of being told that some business friend has failed; and in short, lives in a state of constant foreboding of some impending evil. At times his left leg drags and feels numb, and he is conscious of an unsteady gait. He has also often a twitching of the muscles of the face and eyelids."

Doctor Cole, of England, describes the cases of several individuals who were frequently found lying insensible as the result of tea-drinking. One case which he mentions was an author who was thus found two or three times a week.

Tea and Coffee Neurasthenia

Q. **Does the use of tea and coffee cause neurasthenia?**

A. Yes. The widespread use of tea and coffee in England and America and in other civilized countries is unquestionably a prolific cause of neurasthenia, especially in women who, on the whole, seem to be more susceptible to these drugs than are men, and more addicted to their use.

A man or woman who cannot begin a day's work in comfort without one or two cups of tea or coffee, or who suffers from headache or nervousness when deprived of the accustomed beverage, is a tea or coffee neurasthenic and as much a drug habitue as a person who is addicted to the use of opium or cocaine.

Yawning

Q. **What is the cause of yawning?**

A. Physiologists tell us that in the middle of the upper portion of the spinal cord there is a small nerve center which has charge of the back movement or group of movements which we call yawning. Just what brings this center into action nobody knows. It is a curious fact, however, that the disposition to yawn seems to be to a certain extent infectious. If one of a group of persons yawns another member of the group is almost certain to yawn a few minutes later. Yawning generally occurs when a person is weary or drowsy. Many persons are inclined to yawn after eating. Bathing the face with cold water, drinking a glass of hot or cold water or some refreshing beverage will generally cause the disposition to yawn to disappear.

Indigestion—Causes

Q. **What are the causes of indigestion?**

A. The principal causes of indigestion are:

1. Insufficient mastication of food.
2. Unwholesome foods.
3. A deficient secretion of gastric juice and other digestive fluids caused by condiments.
4. A deficiency of muscular activity of the stomach or intestine caused by too long retention of foodstuffs. The stomach should be empty in four or four and one-half hours after the taking of food and the small intestine at the end of eight or nine hours.
5. The slow absorption of liquids and digested foodstuffs from the intestine.
6. Infection of the alimentary canal with the so-called "wild" bacteria.

Serious disturbances of digestion are much more frequently due to a disorder of muscular activity of the stomach or intestine, or so-called disorders of motility, than to disturbances of the secreting functions of the digestive glands; but gastric acid is necessary for the digestion of proteins. The acid of the gastric juice also stimulates the secretion of pepsin and activates pepsin, or enables it to digest protein. Hydrochloric acid acts as an antiseptic in the stomach, preventing the growth and development of bacteria. In the duodenum, hydrochloric acid causes the formation of secretin which stimulates the action of the pancreas and the liver. It is thus apparent that when hydrochloric acid is absent, several important functions of the stomach and intestine are seriously interfered with.

Mucous Stools

Q. **What is the cause of long, jelly-like and ropy strings found in the stools?**

A. The symptom described is characteristic of colitis, catarrh or infection of the colon.

Function of the Small Intestine

Q. **Of what use is the small intestine in digestion?**

A. The small intestine is the chief organ of digestion and practically the sole organ of absorption of the products of digestion.

Normally three-fourths of the work of digestion is accomplished in the small intestine, and this organ is alone capable of maintaining the entire function of digestion.

The three important agencies of digestion in the intestine are the pancreatic juice, bile and the intestinal juice.

The pancreatic juice and the intestinal juice each furnishes a complete set of ferments. In other words, they are "duplicate plants."

Puffiness under the Eyes

Q. **What is the cause of puffiness under the eyes?**

A. The most common cause is intestinal autointoxication. This is also a symptom of failing heart and diseased kidneys. It is possible one suffering thus may have arteriosclerosis and weak heart resulting. He should submit himself to a competent physician for a careful examination.

Brown Circles About the Eyes

Q. **What causes brown circles about the eyes? Please suggest treatment.**

A. The most common cause of the symptom mentioned is intestinal autointoxication. Brown coloring matters of a poisonous character are formed by the decomposition of animal proteins in the colon. These are absorbed and deposited in the skin. This is the cause of pigmentation of the skin, either about the eyes or in other places. Such persons are often neurasthenic. The most important thing for them to do is to discard the use of flesh foods; that is, adopt an antitoxic diet, live outdoors. Keep the bowels active; they should move at least two or three times a day. The cold water bath daily, the cold air bath, the sun bath and all hygienic means are indicated.

Gas in the Stomach and Intestines

Q. **What is the best remedy for gas in the stomach and intestines?**

A. Gas in the intestines practically always means stasis; that is, material left behind which should have been evacuated. Relief is obtained when the colon is emptied. Flatulence of the stomach is usually the result of air-swallowing. It is very difficult to convince persons who have the habit of swallowing air that they are addicted to such a habit. Nevertheless, careful study will show that in by far the majority of cases, patients who complain of flatulence or gas on the stomach are habitual air swallowers, though unconscious of the fact. What seems to such a person to be raising gas from the stom-

ach, is as a matter of fact the introduction of air into the stomach.

Gas which cannot be expelled is usually in the small intestine and is associated with an incompetent ileocolic valve.

Bad Breath

Q. **What is the cause of bad breath?**

A. Perfume and cosmetics may cover up a bad breath and a dirty complexion, but they do not change them. The cause is loathsome masses of putrescent food remnants in the colon. Foul gases absorbed into the blood find their way out through the lungs and pollute the breath.

A strong odor of the perspiration is due to the same cause. The remedy consists in clearing out that ancient cesspool, the cecum, a hold of every unclean germ. Often the whole colon is filled with rotting remnants of foodsuffs too loathsome for description.

The Coated Tongue

Q. **What is the significance of the coated tongue?**

A. The brown, yellow, and variously colored coatings which appear upon the tongue in certain bodily conditions, consist of germs, which are enabled to grow because of a state of low bodily resistance. It is no doubt true, as remarked by Professor Wainwright, an eminent English physician, that "The state of the tongue may be a good index of intestinal health, and foul condition of the breath speaks volumes of what may be suspected lower down, although the patient may not be constipated."

Sir Bertrand Dawson of the London Hospital and Physician to the King of England, attributed to intestinal toxemia "the sallow dirty complexion, the inelastic skin, the dusky lips and nails, the dirty tongue, evil-smelling breath, constant abdominal discomfort of one kind and another, the doughy inelastic abdomen, cold extremities, and physical and mental depression," so often encountered in chronic invalids.

Sir Lauder Brunton said, "The bacillus coli seems to have especial power of producing fatigue toxins, and many people in whose intestines it exists in great abundance, suffer from constant weariness and a feeling of fatigue." Probably the majority of people who think they are overworked are only constipated.

Dr. Brown called especial attention to the fact that "the poisonous substances formed in the intestine do not give rise to anti-bodies, as do certain other poisonous substances, and that the only way to secure immunity from the poisons is to create a normal intestinal flora by suppressing intestinal putrefaction through dietetic regulation.

Mr. Ernest Clarke an eminent English oculist, called attention to the loss of accommodative power as being produced by intestinal toxemia through hardening of the lens of the eye. He regards this as a useful test for tissue changes produced in the body by intestinal toxemia.

The most pronounced toxic effects are found in high protein feeders who suffer from constipation. Indeed, it is only in such persons that the extreme effects of intestinal toxemia are com-

monly seen. These effects which have been so graphically and accurately described by Combe, Lane, Sir Bertrand Dawson, Schmidt, and others, are so profound, often even tragic, that it is scarcely to be wondered that Lane, Metchnikoff and a multitude of their followers reached the conclusion that an organ which could become a source of so great mischief to the body, might well be eliminated. Hundreds of unfortunate victims, however, bear testimony to the fact that the experiment was not a success, and there are at the present time few prominent surgeons who do not agree with Keith, the eminent English anatomist, in the conclusion that "it is not the organization of the great intestine that has failed, but that our modern dietary sets a task for which it is not adapted. In civilized modern communities, the great bowel has to manipulate a dietary such as was never before prescribed to it at any stage of its long evolutionary history. If an engine runs unsatisfactorily it may not be from a fault in its mechanism, but from a defect in the fuel. Those who regard the great bowel as a useless structure blame the engine; for my part I stand by those who blame the fuel."

Removal of the Colon

Q. **When should the colon be removed?**

A. Only when it is hopelessly diseased and the source of so much inconvenience as to seriously threaten life and health, as in cases of cancer or tuberculosis.

Flatulence From Drinking at Meals

Q. **Why should a glass of water, or even a half glass, taken between meals, cause gas on the stomach?**

A. The symptom referred to may be the result of the swallowing of air while drinking water. It may be due to the setting up of peristaltic movements in the stomach. In cases of hyperacidity in which the pylorous is likely to be too strongly contracted, water drinking, by increasing the acid formation and causing contraction of the stomach, frequently gives rise to eructations of gas that is forced upward on account of the closure of the pylorus preventing its escape downward.

Prolapsed Colon

Q. **What causes prolapsed colon?**

A. Collapse of the colon is the natural result of a relaxed condition of the abdominal muscles. This condition is favored by chronic constipation and by a stooped attitude in sitting and standing. The whole colon may be collapsed or only a portion of it. The collapse is usually confined to the transverse colon. Recent observations have shown, however, that the transverse colon has no fixed position, but changes its position by slow, snake-like movements. These movements probably explain the fact that the omentum is very likely to be found covering and adhering to an inflamed surface in any part of the abdominal cavity.

Ulcer of the Duodenum

Q. **Can ulcer of the duodenum be permanently cured without operation?**

A. Most cases may be cured without operation provided the colon can be made to act properly and the patient can be made to follow the required regimen.

Ulceration of the Rectum

Q. **What is the cause of ulceration of the rectum, and what can I do to prevent the return of this condition?**

A. Ulceration of the rectum is due to infection. The most important thing to do to prevent a return is to build up the general health as much as possible and thus keep resistance high and exercise especial care to keep the rectum thoroughly clean. Any residue of fecal matter left in the rectum will cause local irritation and infection. If the rectum is kept thoroughly clean, this will not occur. In many persons, the bowels are not completely evacuated, a small amount of fecal matter being left behind in the rectum or lower bowel. In such cases, the introduction of a few ounces of cold water just after the bowels have acted will remove any such residue. The introduction of an ounce or two of oil at night is also beneficial.

The anal region should be cleansed with water after every bowel movement. The native Hindoo always does this and thinks the practice of Europeans most uncleanly. When the parts are not cleansed thoroughly, the highly infectious material left behind in folds of the skin and mucous membrane sets up irritation and inflammation

the result of which may be either ulcer, fissure, hemorrhoids or eczema. When the parts are thoroughly cleansed after every stool, irritations present usually soon recover. Even hemorrhoids generally disappear. If anything more is needed, a suppository containing tannin or some other antiseptic may be used after each movement.

Charcoal

Q. Is charcoal of any value in combating intestinal toxemia?

A. Powdered charcoal if taken in sufficient quantity is undoubtedly capable of rendering valuable service in combating toxic conditions of the intestine. Besides producing a laxative effect the charcoal absorbs a considerable amount of the poisons resulting from putrefactive changes in the intestine. Charcoal tablets are of little value unless used very freely.

Diarrhea with Constipation

Q. What is the cause of chronic diarrhea?

A. Diarrhoea often means the same thing as constipation, being due to irritation resulting from retained fecal matters. Frequent bowel movements occur because the bowel is never completely emptied.

The writer has met many cases in which the x-ray showed that a test meal remained three or four days in the colon, notwithstanding the fact that the patient's bowels moved ten or twelve times a day. Bowel movements are too frequent but never complete. The patient feels sure that his bowels move too much and that they should be checked. To make use of bland and con-

centrated foods is a serious error. Such a diet only makes matters worse. Scourers are needed to clear the bowel out and to keep it clean. In no other way can the intestine be restored to a normal condition. The "Fruit Regimen" is especially useful.

Causes of Constipation

Q. **What are the causes of constipation?**

A. The causes are many. The chief ones are:

1. Concentrated food, that is, insufficient roughage or bulk making food.
2. Neglect to attend the "call" of Nature promptly.
3. The use of flesh foods.
4. Lack of exercise, causing weakness of the abdominal muscles.
5. Stooped or "slumped" attitude in sitting.
6. In women, the corset and tight bands.
7. The high closet seat.
8. Irritating condiments.
9. Irregularity of meals.
10. The use of laxative mineral waters and drugs.

Inactivity of the bowels may be due to any one of these several causes. A most common cause is a torpid state of the liver. In cases in which the stool is hard and dry, the immediate cause is deficiency of secretion of mucus by the intestinal mucous membrane. The following suggestions will be found helpful: 1. Eat coarse food, such as brose, peas, beans, vegetables, etc. Avoid meat and condiments, tea, coffee, fats, pastry, and all unwholesome articles

of food. 2. Drink two to three quarts of water daily. The water should be taken an hour before the meal, and not within two hours after. 3. Wear at night a wet abdominal bandage, consisting of a towel wrung out of cold water dry enough so it will not drip, and covered with several thicknesses of dry flannel. The towel should be long enough to go around the body two or three times. It should be taken off in the morning and the surface should be well rubbed with the hand dipped in cold water. 4. Two or three times a day knead and percuss the bowels with the hands for five or ten minutes very thoroughly.

Flesh Eating and Constipation

Q. Are the effects of constipation worse when meat is eaten?

A. Yes. Constipation is an exceedingly damaging condition to any person, but this is especially true when flesh food of any sort enters largely into the dietary. Eggs and flesh food readily undergo putrefactive changes. This is just as true within the body as outside of the body, and is especially true in the body for two reasons. The conditions of warmth and moisture within the body are exactly such as favor decay in the highest degree; and besides there are always found in the intestine many millions of active, putrefactive bacteria, which quickly set up decay in any putrescible substances with which they may come in contact.

A beefsteak smeared with fecal matter and left in a warm place would certainly undergo very active putrefaction. The same beefsteak

in contact with the same fecal matters within the body would undergo decomposition with equal facility. The more largely eggs and meat enter into the dietary, the larger will be the amount of undigested remnants of these putrescible foodstuffs, and the greater will be the amount of putrefaction products. The free use of eggs and meat is unquestionably a widespread cause of disease through the encouragement of intestinal putrefactions resulting in intestinal autointoxication.

Vegetarians may suffer much the same as meat eaters when milk and eggs are freely used. Even persons who are strict vegetarians, but who are constipated, may suffer from intestinal putrefaction. In these cases the putrefaction is doubtless in large part due to the fact that the intestine has become diseased and infected by the long use of putrescible foods, and the active germs which are present find a sufficient amount of food material, even in such foodstuffs as nuts, cereals, peas, and beans, to maintain an active putrefactive process,

Constipation and Hyperacidity

Q. **Will constipation produce hyperacidity?**

A. The constant association of hyperhydrochloria or gastric hyperacidity with intestinal autointoxication or toxemia has been observed by many authors; but, so far as the writer is aware, little or no attention has been given to what seems to be a very evident relation between intestinal putrefaction and hyperacidity. Roger, who has made an elaborate study of the toxins produced in the alimentary canal under various

conditions, has demonstrated that one of the functions of the stomach is to excrete poisons from the blood. He holds that these poisons may be derived from intestinal putrefaction, and one of the functions of the stomach is to eliminate the poisons absorbed from the intestines. He found the toxicity of the contents of a rabbit's stomach to be 11.5 c. cm., the amount required to kill a rabbit; the larger the amount the less the toxicity.

That of a dog fed on meat was 4.5, nearly three times as great. Cassaut and Soux found the toxicity to be 5.3. The gastric juice tested by them was found to have a toxicity of 30. When meat was digested in the gastric juice, the toxicity was 13.7, more than double.

Colds and Constipation

Q. **Is a cold the result of constipation, or does a cold produce this disease?**

A. A person suffering from a cold is usually constipated, but on investigation it will generally be found that there had been more or less constipation before the cold was contracted. The cold is, of course, aggravated by constipation, because it leads to the accumulation of poisons. In a condition of cold there is already an accumulation of poisons, and one of the measures of first importance in getting rid of a cold is to increase the activity of the bowels. The bowels ought to be made to move three or four times a day.

Incompetency of the Ileocecal Valve

Q. **Does incompetency of the ileocecal valve cause autointoxication?**

The ileocecal valve is a check valve which prevents putrefying wastes and food residues in the colon from backing up into the small intestine. This is highly important for the reason that absorption is very rapid in the small intestine, whereas there are few absorbants in the colon. It appears also, that the mucous membrane lining the colon is a better filtering medium than that of the small intestine. Professor Ad. Smith holds that autointoxication never occurs unless the ileocecal valve is incompetent. When the colon is for a long time distended by retention of its contents, the cecum becomes dilated and the opening between the small and the large intestine is so increased in size that the valve is no longer able to close the opening and the consequence is backing up of putrescent material into the small intestine, giving rise to infection and absorption of toxic matters. The ileocecal valve is found incompetent in practically all cases of disease of the gall-bladder, gallstones, diabetes, sick headache and other conditions due to chronic intestinal toxemia.

Repair of Incompetent Ileocecal Valve

Q. **Can an incompetent ileocecal (ileocolic) valve be repaired?**

A. Fortunately this defect, which is now believed to be responsible for many serious bodily ailments, may be completely repaired. It is also gratifying to note that the operation is safe and that the good results are likely to prove permanent.

Although the operation is comparatively recent, several years have elapsed since the first cases operated upon and x-ray examinations have shown that the repaired valve still performs its functions in a perfectly normal manner.

Tight Anal Sphincter

Q. **Is it true that undue contraction of the anal muscle gives rise to nervous prostration, insomnia, debility, etc., through pressure upon the sympathetic nerves?**

A. The innocent public has been humbugged to an enormous degree by so-called rectal specialists or orificial surgeons who have claimed to find in rectal disorders the cause of almost every malady known to medical science. Most chronic ailments are due to incorrect habits in diet or in other particulars. When the cause is removed, recovery is generally quite prompt through the natural recuperative powers of the body. Anal hypertension is a symptom, not a cause. When a tight sphincter interferes with bowel movements it should be stretched.

Rectal Dilators

Q. **Will the use of rectal dilators cure piles, fistula, and especially a contracted condition of the sphincter ani, as claimed by various specialists?**

A. If you are suffering from any of the difficulties named, by all means consult a reliable surgeon. Do not waste time in the use of dilators or any other mechanical means. It is true that some persons have apparently been relieved of trifling rectal ailments by the use

of dilators, but even in these cases it is quite possible that suggestion may have played an important part.

Dilation of the Colon

Q. **What is the most common cause of dilatation of the colon?**

A. Sedentary habits, causing weakening or relaxation of the abdominal muscles; a relaxed, forward stooping position in sitting; overeating; neglect to attend to the calls of Nature for emptying the bowels; a constipating diet, especially the use of fine-flour bread and concentrated foods.

Fat Fermentation

Q. **Do fats ferment in the intestine?**

A. According to Taylor: "The fats are very resistent to fermentation in the intestine, and even under pathological conditions it is rare to find an active fermentation of fat. There is no foundation for the fear that an acidosis may be caused by the formation of harmful acids from fatty acid in the intestine."

Ferments of the Intestinal Juice

Q. **What are the ferments of the intestinal juice?**

The intestinal mucous membrane is the one tissue that forms all the different ferments employed in digestion. These ferments are: amylase, maltase, invertase, lactase, emulsin, erepsin,

The intestine alone may accomplish the entire work of digestion without the aid of the sali-
lipase, chymosin.
vary glands, the stomach or the pancreas.

Nearly the whole work of digestion and ab-

sorption is done by the small intestine. The stomach digests little and absorbs less. The small intestine absorbs nearly six quarts of liquid daily. The colon absorbs only ten or twelve ounces. It is quite evident then that the small intestine is the most important part of the digestive apparatus. Notwithstanding this fact, half of the small intestine (ten or twelve feet) has been successfully removed. In these cases nutrition was found to be somewhat impaired but according to Albu one-third of the small intestine may be removed without disturbing nutrition. Lane and numerous other surgeons have shown that practically the entire colon may be removed, not only without injury to the health, but with great advantage to the patient in certain cases.

Extent of Intestinal Putrefaction

Q. **To what extent does putrefaction take place in the intestine?**

A. According to Nencki, MacFayden, and other investigators, not less than one-seventh of the total amount of protein eaten is ordinarily destroyed by putrefaction, thus occasioning a very considerable loss to the body. But the loss of an important food principle is a matter of small consequence compared with the mischiefs which result from the poisons into which this one-seventh of the nitrogenous food supply is converted, instead of being converted into human albumin adapted to the nutrition of the body.

In view of the above facts it is highly important that an excess of protein should be avoided, since a large intake of protein is certain to be followed by an increase of the amount

of putrefaction in the colon. A low protein diet is of the greatest importance in cases of Bright's disease, neurasthenia, sick headache, diabetes, and all cases in which the stools are putrid and in which chronic intestinal toxemia or autointoxication exists.

Intestinal Flora

Q. **What is meant by the intestinal flora?**

A. Plants which grow in a locality are known as its flora. Germs are microscopic organisms which belong to the vegetable kingdom and hence the germs found in the intestine are known by bacteriologists as the intestinal flora. Much attention has been given to the study of these intestinal germs.

Herter, as well as others, has clearly shown that the number of these pernicious toxin-producing organisms present depends largely upon the character of the food,—the larger the amount of protein food, the larger the number of organisms. The feces of the lion, tiger, wolf, and cat showed enormous numbers of these pathogenic organisms. On the other hand, examination showed the fecal matters of the buffalo, goat, camel and elephant to be very free from virulent organisms. In other words, Doctor Herter shows that there is a distinct herbivorous type of bacterial flora. When broth was inoculated with feces, he found mercaptan was produced by the feces of carnivorous animals, but that none was produced by the feces of herbivorous animals. Emulsions of carnivorous feces inoculated into guinea-pigs gave rise to edema, hemorrhages, and destruction of tissues. Gas

and butyric acid were formed. The effects were similar to those produced by Welch's *bacillus aerogenes capsulatus.*

Food Absorption

Q. **In what part of the intestine is food absorbed?**

A. The most rapid absorption occurs in the lower duodenum and upper jejunum and lessens gradually from the upper part of the jejunum to the lower part of the ileum.

There is practically no absorption of food products from the colon.

Putrefaction in Starvation

Q. **Does intestinal putrefaction occur during starvation?**

A. Intestinal putrefaction does not cease in starvation. On the contrary, after the first few days the signs of intestinal putrefaction in the urine and feces indicate that the bacteria in the intestine are very active. The material on which they feed is the protein of the intestinal secretions.

These proteins are apparently rich in phenylamino-acids and tryptophan, as phenol and indol compounds are prominent in the urine and feces of the starving individual. The action of bacteria under these conditions is heightened by the presence of constipation. And though we must believe that the mass of alimentary secretions is much reduced in the state of starvation, their prolonged retention in the lower intestinal tract affords to bacteria full opportunity for action.

Rectal Pain

Q. **What will relieve rectal pain?**

A. The pain of hemorrhoids and rectal ulcer generally yields to fomentations applied over the anal region. A very hot sitz bath is usually effective in cases of this sort. The water need not be more than two or three inches deep, but should be as hot as can be borne, the temperature being gradually raised, after the patient enters the bath, to 115° or 120° F. The pain of inflamed hemorrhoids is sometimes best relieved by an alteration of heat and cold. In cases in which there is great pain at stool, relief is often experienced by sitting over a pail or jar half filled with boiling water while moving the bowels. The hot steam relaxes the sphincter, and exercises a powerful analgesic effect upon the painful tissues.

Painful Defecation

Q. **What is the best means of relieving pain which occurs soon after moving the bowels?**

A. Hemorrhoids are often the cause of pain, but this pain usually occurs at the time of the bowel movement. A sharp, acute pain is generally due to a fissure or fistula. In some cases, the pain is the greatest in the act of defecation, in others it is most severe half an hour later. The latter is the case when the pain is the result of fissure. Of course the proper mode of treatment will include radical measures or surgical interference; nevertheless, much can be done to mitigate the sufferings of the patient without a surgical operation. One of the very best means we know of is evacuation of the bowels in steam

over warm water. Instruct the patient to sit over a vessel nearly full of hot water, as hot as can be borne without burning. This will so relax the parts as to greatly diminish the pain; and if the contents of the bowels have been softened by an enema, as should always be done, the patient may get along with scarcely any pain at all. Surgery is often necessary.

It is highly important in these cases that the bowels should move three times a day and the stools should be made soft by the use of sterilized bran and paraffin in some form, preferably paraffin tablets.

Hemorrhoids

Q. **Is there any remedy for hemorrhoids without an operation?**

A. Yes. Most cases of hemorrhoids may be so greatly helped by prolonged cold sitz baths that an operation becomes unnecessary. The water should be about three or four inches deep in the tub, with the temperature 60° F. The duration of the bath should be from twelve to twenty minutes. The feet should be placed in hot water at the same time, and a woolen blanket should be wrapped about the body to prevent chilling. Hemorrhoids may be cured by a painless electrical method. Constipation must be prevented.

Internal Hemorrhoids

Q. **What is the cause and what should be the treatment for internal hemorrhoids?**

A. Internal hemorrhoids are usually due to chronic constipation. Relief may generally be obtained by keeping the bowels in an active

state, so that straining and hard stools will be avoided. It is also well to introduce some antiseptic suppository after each bowel movement to prevent infection and inflammation of the infected part. A suppository made of cocoa butter and containing one or two grains of tannic acid is very serviceable for this purpose.

By the use of an emulsion of paraffn oil and other laxative foods and care to move the bowels regularly two or three times a day, the inconvenience which has been suffered from hemorrhoids will usually disappear. In extreme cases, however, in which large masses are formed and the tissues have been greatly changed by disease, an operation is advisable. The hemorrhoids may be removed by a very simple operation that involves little or no pain, and no risk of life, and that is radically effective.

Cause of Colitis

Q. **What is the cause of colitis?**

A. According to Tissier, of Paris, colitis and enteritis would not exist but for the eating of animal foods. Meats of all foods have a tendency to produce these diseases—particularly because they contain the very germs that cause them. These germs, moreover, are known to be identical with the germs that produce the putrefaction of meats, so that with every morsel of flesh infection is taken into the system. In other words, eat enteritis and colitis and you have them; leave them out of your dietary and you will be immune against them. Enteritis and colitis are inflammation or catarrh of the intestines—enteritis of the small and colitis of the

large intestine, and both spring directly from the masses of undigested flesh particles which lie about in the intestines rotting because they contain germs whose function it is to produce decay and putrefaction.

Colitis is very likely to follow an attack of food poisoning, especially when due to the use of infected meat or "botulism," or the eating of infected eggs. Constipation is a frequent cause of this infection.

Colic

Q. **What will relieve the intense pain caused by gas in the stomach or abdomen?**

A. The best measures are the hot enema and hot fomentations. The hot full bath is sometimes necessary. The most obstinate cases are those in which the ileocecal valve is incompetent. Such cases sometimes require an operation for repair of the valve.

Intestinal Catarrh—Colitis

Q. **What is the cause of passages from the bowels of mucus and strings of what looks like the mucous lining accompanied with great tenseness and nervousness and mental and physical depression?**

A. The presence of opaque mucous "strings" and "flakes," masses or "casts" of mucus in the bowel passages is evidence of the existence of infection of the intestine. The colon is the part most commonly affected, and hence the name "colitis." The cause is constipation,—the long retention of putrefying fecal matters in contact with the mucous membrane of the colon.

It is for this reason that colitis most commonly affects the lower half of the colon.

One of the consequences of colitis is a cramp-like contraction of the colon which causes an aggravated form of constipation, the so-called "spastic constipation."

Another serious result is intestinal toxemia, due to the ready absorption of poisons through the diseased mucous membrane. This is the explanation of the nervous and other symptoms which accompany this condition.

Combe and others have pointed out that colitis is a meat eater's disease. That is, those who do not eat meat are little subject to this malady, which is exceedingly common in meat eaters. This is equally true of appendicitis, because appendicitis is one of the consequences of colitis.

Colitis is always curable if the patient is willing to make the necessary effort. Treatment measures must be thoroughgoing and the regimen must be very carefully regulated. For a rapid cure, all animal proteins must be excluded from the diet. That is, milk, eggs, and meats of all sorts must be discarded. Losier has shown that the germs which cause colitis thrive on animal proteins and starve on vegetable foods.

The bowels must be made to move three or four times a day whenever it is possible, and the protective ferments *Bacillus Bulgaricus, B. acidophilus* and *B. bifidus* should be taken daily for a few months. The cure is hastened very much by cleansing the colon daily and then flushing with suitable solutions containing the pro-

tective ferments. By this means the friendly germs are planted where they are most needed. The intestinal flora must be changed, and the habitual diet must be such as to make the change permanent.

Colon Pain

Q. **What is the cause of a dull aching pain in the left side of the body near the upper portion of the groin?**

A. This pain is usually due to colitis. When this is the cause, pressure over the seat of pain will reveal a tender area usually extending along the side for several inches and when the accumulation of fat is not too great the colon may be outlined giving the impression of a firm tubular shape.

Absorption by the Colon

Q. **To what extent is food absorbed by the colon?**

A. There is practically no absorption of food by the colon. Almost the entire work of absorption is performed by the small intestine, which is also the principal organ of digestion. According to Taylor, the small intestine absorbs about six quarts a day, or an average of two quarts for each meal. The amount absorbed by the colon is not more than ten or twelve ounces during twenty-four hours. It has been demonstrated by the physiologists that while the colon absorbs water with considerable avidity, it absorbs no fat at all and only the most minute quantities of carbohydrates and protein, so it practically takes no part in the work of digestion. The lower half of the colon also

excretes salts, fats and various metallic substances, especially iron and lime. These same substances are excreted by the small intestine and through the bile to some extent, but to a much less degree. The lower half of the colon appears to be the chief organ for the excretion of lime and metallic salts. "The ileocecal valve forms a sharp line of demarcation" between the colon and the small intestine.

Examination of the Colon

Q. **Is it possible to follow the colon from the surface of the body?**

A. Yes, especially when the colon is filled with hardened material and the abdominal walls are very thin, the colon can be easily marked out. It is best studied with the x-ray.

Greedy Colon

Q. **What is meant by greedy colon?**

A. In chronic constipation the colon seems to acquire the faculty of destroying and absorbing a considerable amount of insoluble materials which are not absorbed by normal colons. The small residue of fat which maintains a plastic condition of the feces in normal conditions almost entirely disappears in constipation. When the bowels are constipated by means of opium, the stool is dry because of the absorption of water, but the dried residue is not diminished. It is probable that the disappearance of cellulose in the colon in constipation is due to the action of bacteria. Even bran and agar-agar often disappear in large quantities in such cases ,especially if finely ground. Some

authorities apply the term "greedy colon" to such cases, although the colon is not at fault.

Weight of Feces

Q. **What is the normal weight of the feces?**

A. The weight of the stool on a milk diet is rarely above 50 grams,—one and two-thirds ounces.

The weight of the stool on a mixed diet is 50 to 300 grams, seldom under 100 grams.

The more fruit and vegetables, the greater the weight of the stool.

The daily stool in a vegetarian or fruitarian may weigh a pound or more.

Normal Color of the Stools

Q. **What is the normal color of the feces?**

A. The best example of the normal feces is to be seen in the discharges of a young infant, which are yellow in color and are either odorless or have a slight acid odor. When putrefaction is present the stool is usually black or brown in color and has a very offensive ammoniacal or putrid odor. The stools of adults generally have this appearance. In nearly all cases more or less putrefaction is present. By change of the flora the stool may be made to acquire an appearance closely resembling that of an infant.

Examination of Feces

Q. **Is it possible to obtain any important information concerning the condition of the body by examination of the stools or bowel discharges?**

A. The examination of the feces is a most valuable means of diagnosis, especially in cases

of chronic disease; it is in fact a necessary part of the thoroughgoing investigation of a case.

This examination not only determines the presence or absence of intestinal parasites, such as tapeworm, hookworm, amœba, etc., but indicates the kind of bacteria present, and hence gives the key to the character of the fermentations taking place in the intestines, and the nature and amount of the bacterial toxins produced. Repeated at intervals of a week or two, it affords an opportunity to watch the gradual change of the intestinal flora from a noxious to a friendly sort, under the influence of an antitoxic diet and the use of antitoxic ferments.

The Enema

Q. **Do regular daily enemas have a debilitating effect?**

A. Hot and warm enemas have a relaxing tendency. Cool enemas, that is, at a temperature of 85° to 70° F., have a tonic effect.

Dry Stools

Q. **What is the best remedy for very dry stools?**

A. The best remedy is the use of mineral oil, or so-called paraffin oil in some form. An emulsion of the oil or a heavy preparation which melts at the temperature of the body is better than the ordinary product. In some cases the most relief is obtained by introducing into the rectum a few ounces of a heavy paraffin oil which melts at the temperature of the body. The oil must be warmed before introduction. It is well to introduce the oil just before retiring at night and with the body in a knee-chest position.

Function of the Appendix

Q. **Of what practical use is the appendix in the body?**

A. The appendix secretes the mucus which lubricates the alimentary bolus, which is brought to the lower end of the cæcum.

Appendicitis

Q. **Is an operation necessary in every case of appendicitis?**

A. A surgeon should be consulted in every case of appendicitis. Each individual case must be judged on its merits. Severe cases of appendicitis require prompt surgical intervention. In cases of chronic appendicitis the danger of a fatal issue is much less than in acute appendicitis, but the condition is one of too much gravity to be safely ignored.

At the beginning of an attack, the bowels should be moved by a large enema containing a little soap or an ounce of sulphite of magnesia. Apply hot hip and leg packs (see index) every three hours, with one or two ice-bags in the right groin continuously.

If the patient does not improve rapidly as a result of the thorough application of the above treatment, as shown by the lower temperature, a slower pulse, and relief from pain, a thoroughly competent surgeon should be consulted. The most desirable time for performing an operation in a case of acute appendicitis is within the first twenty-four hours. Later than this, the disease is likely to be found extensively involving the surrounding tissues and operation is much more difficult. In such cases, if the pa-

tient shows indications of recovery, the operation may be postponed to some days later when the symptoms of inflammation have disappeared. But if an operation is decided upon, it should be done promptly. Delay is perhaps unwise in any case in which operation is clearly shown to be necessary. When abscess results, as shown by thickening, swelling, continued pain, and temperature, the abscess is usually opened and drained without attempt to remove the appendix. It must always be remembered that appendicitis is generally simply an extension of infection from the colon to the appendix. Removal of the appendix will not cure the diseased colon. This must receive proper attention later.

Recurring Appendicitis

Q. **Is an attack of appendicitis liable to make one susceptible to a second attack?**

A. Yes. Appendicitis doubtless begins in the colon. It is due to an extension of the infection of the colon to the appendix. When a person has had an attack of appendicitis, it is evident that the colon is infected, and unless the colon is cured, the attack is likely to recur. There is no doubt, however, that by means of an antitoxic diet and proper care to secure a thorough movement of the bowels two or three times daily, a person who has recovered from one attack of appendicitis need not have another unless the condition is quite unusual.

Constipation Curable

Q. **Is chronic constipation curable?**

A. Yes. Constipation is always curable. By curable is not meant that the colon and its functions can be restored to a perfectly normal condition. What is meant, rather, is that by proper care and management and the use of harmless measures, which can be continued for an indefinite period, the colon may be made to evacute its contents so that autointoxication and other evils resulting from intestinal stasis or constipation may be prevented. This cannot always be accomplished by a simple treatment alone. In some cases the colon become so badly crippled that surgical measures are necessary. The following conditions especially sometimes require surgical intervention:

1. Hemorrhoids and anal fissure.
2. Prolapse and adhesion of the pelvic colon.
3. Adhesions of the appendix or cecum.
4. Dilatation of the cecum.
5. Incompetency of the ileocecal valve.
6. Adhesions which obstruct the colon by compressing or constricting it.
7. Cancerous growths, tuberculosis and other lesions of the colon which produce mechanical obstructions. Fortunately almost all these cases can almost certainly be relieved by surgical procedure, except cancer and tuberculosis when too far advanced.

Short Circuiting of the Colon

Q. **What is short circuiting of the colon?**

A. In short circuiting of the colon, the small intestine is detached from its normal connection with the colon and is connected with the pelvic colon, the loop of the large intestine which joins the rectum. This operation, devised by Dr. Lane of London, has been performed in many cases for the purpose of relieving intestinal toxemia or chronic constipation, and in some cases with apparent benefit, but unfortunately the benefit has in most cases proved to be only temporary and in many instances the patient has been made much worse than before. The operation is rapidly falling into disfavor among the best surgeons. Later experience has shown that the operation is rarely necessary for the following reasons:

1. By regulation of the diet, especially by the adoption of an anti-toxic or fleshless diet and by encouraging activity of the bowels through the use of sterilized bran, agar-agar and paraffin oil, constipation and intestinal toxemia can be successfully combatted in a large proportion of the cases in which the operation of short circuiting has been thought to be necessary. This has been demonstrated in a very extensive way at the Battle Creek Sanitarium and other institutions in which the dietetic and other measures for correcting the intestinal toxemia have been employed in a thoroughgoing way. Combe has obtained like successful results by non-surgical means.

2. Observations by Dr. J. T. Case, roentgenologist of the Battle Creek Sanitarium, and clin-

ical observations by the writer and his associates have clearly demonstrated that the so-called Lane's kink or adhesions of the small intestine near its point of junction with the colon is not the cause of the intestinal toxemia which Doctor Lane has considered to be an indication for the performance of the operation of short circuiting. It has been shown instead that the toxemia which is caused by the retention of foodstuffs in the small intestine is not due to an obstruction by a kink, but to a reflux or backing up of decomposing material from the colon because of incompetency of the ileocecal valve. What these cases really need then is not short circuiting, but simply repair of the ileocecal valve. The correctness of this view has been established by the performance of this operation in more than two hundred cases with complete success in nearly every case. By repair of the valve the so-called "ileac stasis" is cured and the former symptoms of toxemia, headaches, loss of appetite, coated tongue, foul breath, pigmentation of the skin, and other symptoms of chronic toxemia have been made to rapidly disappear.

3. The operation of short circuiting cannot succeed permanently for the reason that the new point of junction between the small intestine and the colon is not protected by the valve which is normally found at the ileocolic junction, and the consequence is, after a few months fecal matters back up into the small intestine, many feet of which become distended with fecal matters, thus the patient is even worse off than before the operation. Whenever an operation for transplanting the small intestine to another part

of the colon is performed, an artificial ileocecal valve should be made so that the opening may be properly guarded.

Intra-Abdominal Tension

Q. **What is intra-abdominal tension?**

A. If a small opening is made in the abdominal wall, the intestine quickly finds is way into the opening and is forced outward. This is the cause of hernia. There is maintained more or less constantly within the abdominal cavity a tension. This is necessary to support the large blood vessels which are found in this part of the body and also to promote movement of materials along the intestine and the discharge of waste matters from the body. This internal tension is of very great importance. It aids in regulating the circulation of blood and in various other functions, some of which are:

1. The tone of the intestinal wall.
2. The size of the intestinal canal.
3. Action of the intestinal muscles.
4. Pressure of the abdominal wall.
5. Pressure of the diaphragm during inspiration.
6. Gas distension of the intestines.

Experiments have shown the great influence of variations of intra-abdominal pressure upon the rate of absorption. It aids absorption by direct pressure from behind just as increased atmospheric pressure aids the passage of a solution through a filter. This is a factor of great importance.

This is the reason why patients are benefited by deep breathing exercises after meals, by lying

upon the face over a pillow, by lying with a weighted or inflated compress over the abdomen and by abdominal massage. A boy who has eaten too much dinner instinctively compresses his stomach by lying over the arm of a chair or a barrel or any other convenient object.

Laxatives in Toxemia

Q. **Does clearing the bowels by laxatives lessen intestinal toxemia?**

A. An investigation conducted by Schulz (*Berlin. Klin. Woch.,* June, 1900) shows that intestinal antiseptics diminish the ability of the intestine to destroy bacteria. After a dose of castor oil and calomel, cholera germs were found abundantly in the stools of dogs to whom cultures of this micro-organism had been given, while before the calomel was given no bacteria were found although large quantities of cholera germs had been introduced into the intestine in such a way as to avoid action by the gastric juice. This experiment indicated that the intestine has in some way the power to destroy bacteria, probably, as suggested by Buchler, by means of a special ferment. Calomel interferes in some way with the action of this protective process.

Intestinal Autointoxication

Q. **What is the meaning of the term "intestinal autointoxication" and what are its symptoms?**

A. Intestinal autointoxication is a grave condition of the body which results from the absorption of poisons from the intestines. The source of the poison is putrefaction of undi-

gested remnants of protein foodstuffs. Things which will putrefy outside the body will also undergo decay in the body. The conditions of the intestine are, in fact, specially favorable to promote putrefaction. A piece of raw meat applied next to the skin and covered will decay rapidly, and become extremely offensive within a few hours. The same piece of meat lying undigested in the colon or the lower part of the small intestine, will undergo the same change. The poisons produced are absorbed into the body and produce disturbances of various sorts. Intestinal autointoxication, resulting from the combined influence of chronic intestinal inactivity and the free use of flesh foods, is doubtless responsible for a great share of the chronic diseases which are daily increasing in number and fatality and threatening to destroy the very race.

The following symptoms of intestinal autointoxication are mentioned by Combe in his excellent work on this subject: "Drawn features, a sad expression, skin yellow or pale, dryness of the hair, ends of the hair split, scaly scalp, sunken eyes, whites of the eyes yellow or dingy, brown discoloration of the eyelids, cheeks, or other portions of the skin; lips red and congested, redness increased during acute attacks, sometimes swollen and hot; chest emaciated, abdomen bulging or contracted; nails soft and brittle, transverse notches indicating acute attacks of toxemia, sometimes white patches on the skin of the neck or armpits; glands in the groin enlarged, movable but not sensitive; general perspiration or perspiration of the hands and feet,

especially during sleep. Loss of appetite, irregular appetite, abnormal appetite, often disgust for meat, desire for plaster, sand, twine, earth, ravenous appetite; feeling of tightness at the waist after meals; colic, abdomen swollen, veins of the abdomen dilated, especially about the ninth and tenth ribs. In young children, liver often enlarged. Sometimes contraction of the pylorus; often contraction of the colon. Attacks of vomiting and diarrhea, bilious attacks, attacks of jaundice, pain in the region of the liver, hardening of the liver, hemorrhoids, abdominal dropsy, gall-stones, rapid pulse, symptoms resembling angina pectoris, pulsations throughout the body, sensations of heat, palpitation of the heart, abnormally slow pulse, subnormal temperature, swelling of the eyelids on awakening in the morning, swelling of the ankles, neurasthenic symptoms, migraine, sick headache, loss of memory, especially for proper names. Epileptoid attacks, tetany, mental disturbance, impoverished blood, pernicious anemia, senility, premature whiteness of the hair and beard, incapacity for muscular exercise, dwarfed growth; various skin diseases, especially prurigo, itching, eczema, and other eruptions, urticaria, acne, and boils."

More recent studies of the effects of intestinal toxemia indicate that this condition is a factor in nearly all forms of chronic disease. Even diseases of the eye, both acute and chronic are known to be caused by toxins or infections derived from the colon. Premature aging of the eye has been cured in many cases by correcting a condition of intestinal toxemia. Doctor Bulkley,

of New York, has shown that many skin diseases disappear when flesh foods are discarded from the diet.

Intestinal Bacteria

Q. **How do intestinal bacteria produce disease?**

A. The disease-producing bacteria which develop in the intestine produce their injurious effects through the poisons which result from their growth. These poisons are of two classes: First, those which are produced by the bacteria while they are alive and which may be regarded as excretory products; second, those poisons believed by many to be still more virulent in character and consequences, known as endotoxins, which are formed within the bodies of the bacteria and are set free after death.

It is probable that each species of bacteria produces its own special poisons, each of which produces specific effects upon the body, so that in reality each different species of these bacterial parasites may produce a different or specific disease.

At the present time bacteriologists do not possess sufficient knowledge of bacteria or their products to be able to distinguish or designate the different forms of disease to which these enemies of life and health give rise, except with reference to a few species. Future discoveries will doubtless throw much light upon this question.

Worms

Q. **What is the cause and remedy for worms?**

A. The human alimentary canal is subject to infection by several different species of worms. Some of these inhabit the small intestine and others the colon. No animal parasites of any sort locate themselves in the stomach for the reason that they are not able to withstand the digestive action of the gastric juice. The tapeworm which is perhaps the most common of these unwelcome tenants of the alimentary canal lives in the small intestine and the mucous membrane to which it attaches itself, obtaining its sustenance from the digested foodstuffs with which its body is bathed. Such an arrangement is essential for the life of the tapeworm for the reason that it has no digestive organs of its own and hence can exist only at the expense of the digestive function of some other animal. Two varieties of tapeworm are found in the human body, one of which is derived from eating infected beef, and the other from pork. The former species was found by Doctor Liedy, of Philadelphia, to be ten times as common as the latter. Several of the parastic worms which infect the intestine, particularly those found in the colon, are introduced into the body through the eating of fresh vegetables which have been infected through fertilization by sewage, especially "night soil." When worms are present they may usually be found in the stools. Each particular species of worm requires its own remedy. When worms are found, a competent physician should be employed.

Trichina

Q. **Is the trichina a dangerous parasite? Is it found in other animals besides the hog?**

A. The trichina is usually found in pork, though it may infest the flesh of numerous other animals as well. Cases have been reported in England, in which it was found in calves. It has also been recently discovered in the hippopotamus. It exists only in the lean flesh of animals, and is found among the muscular fibres or enclosed in little sacs or capsules. When taken into the stomach by eating of flesh containing it, the worm is soon liberated from its capsular prison, and in the course of a week undergoes complete development. It speedily brings forth young in immense numbers, a single worm producing, it is stated, one thousand or more young. The young worms very quickly begin to penetrate the system, either by boring their way through the intestinal walls and thence to the muscles, their final destination, or by getting into the blood vessels and being swept along with the blood current. Which is the real method of distribution has not yet been determined.

After reaching the muscles it penetrates the sheaths of the fibres, and finally becoming quiet, coils itself up and after a time becomes encapsulated.

Symptoms of Trichinae Infection

Q. **What are the symptoms of infection with trichinae?**

A. At first the symptoms resemble those of cholera morbus, dysentery, or some other serious bowel disturbance. When the young worms be-

gin to penetrate the system, the symptoms become more general, and simulate rheumatism, cerebro-spinal meningitis, typhoid fever, and other diseases. This is the reason why the malady is often overlooked. Indeed, there is reason for believing that the largest share of the cases of this disease are not detected. Whether or not death results, depends upon the number of parasites received into the system and the vitality of the patient. Death usually occurs from exhaustion, but may be caused by paralysis of some of the muscles involved in respiration.

The United States government has several times warned the public that pork should not be eaten without being thoroughly cooked on account of the great frequency with which the hog is infected with this disease.

The incurable character of the malady and the extreme liability of contracting it, seem to us to be ample grounds for discarding the use of pork altogether. The hog is well qualified to act the part of a scavenger, for which he was evidently by nature designed; but there is plenty of food for human beings far superior in quality to swine's flesh.

Tapeworm

Q. **What are the most prominent symptoms of tapeworm, and by what means may the parasite be expelled?**

A. The most prominent symptoms of tapeworm are colicky pains in the lower part of the abdomen, especially after fasting, relieved by a full meal; ravenous hunger, distention of the bowel with gas, alternate constipation and

diarrhea, itching and prickling sensations; in children, convulsions; the passage of portions of the worm. Of the various symptoms just named the last is the only positive sign of the presence of tapeworm. No patient should ever be treated for tapeworm unless the positive signs of the presence of the parasite are first detected. The application of measures for expelling the worm must be managed by a physician. There are various remedies, but they should be used under the supervision of a competent medical man, as is true of the use of all poisons.

Origin of the Tapeworm

Q. **What is the origin of the tapeworm?**

A. The tapeworm is always due to the eating of flesh which has been imperfectly cooked. The embryos of the young tapeworm are found in little sacks or cysts in the lean flesh of beef or pork.

The embryos of tenia solium may be seen with the naked eye, looking like small bladders in the lean meat of pork. In beef the cysts are too small to be readily seen with the unaided eye. Flesh containing these creatures is said to be "measly." This disease is very common in Ireland, where, according to good authorities, as large a proportion as three per cent of the hogs are affected. The disease is communicated to man by eating measly flesh without sufficient cooking to kill the embryos; hence it is most common among those who eat raw meat. Pork-packers and cooks are said to be most frequently affected with tapeworm, which is probably due to the habit of eating raw meat when about

their work. Among the Abyssinians, whose regular diet is raw flesh, almost every person has a tapeworm.

It was formerly supposed that the danger of acquiring this disagreeable tenant was wholly connected with the use of pork; but the researches of Doctor Leidy, of Philadelphia, have shown that the variety of the worm which is most common is that caused by the use of raw beef.

Tapeworm has, in rare instances, been the cause of death. It is a cause of weakness and general vital depreciation, and may, in this way, by lowering vital resistance, predispose to diseases such as tuberculosis and other maladies which may result in death, although it does not usually itself lead to a fatal result.

Rheumatism

Q. **What is the cause of rheumatism and what should be the diet and treatment for people suffering from rheumatism?**

A. The term rheumatism is somewhat loosely employed. It is applied to inflammatory conditions of the joints, to degenerative changes in the joints, and to painful affections of the nerves and muscles. These conditions are due to a great variety of causes, and hence cannot be considered as a single or well-defined disease. Inflammation of the joints is due to infection. Degenerative changes may be due to infection, or to the influence of toxins absorbed from the intestine, or from other parts. Rheumatism of the muscles and nerves is probably due in most cases to toxins, the most common source of

which is the intestine. Infection of the teeth or the tonsils is known to be a frequent cause of joint rheumatism. Colitis, infection of the colon —a frequent result of constipation—is very often associated with rheumatism.

In general, the diet should be anti-toxic and laxative. That is, meats of all kinds and condiments should be discarded, and the diet should be made bulky, consisting of fruits and vegetables. Potatoes and other vegetables and fresh fruits should chiefly compose the diet.

Simple rheumatism is quite promptly cured by rest in bed and proper applications to the affected joints. The best measures are the following. Apply very hot fomentations to the joints three times a day. A wet compress should be worn all the time, both day and night. Care should be taken to cover the compress to keep it very warm. The photophore or electric light is also an excellent means for treatment of rheumatism.

The great success of certain European springs in the treatment of rheumatism is chiefly due perhaps to the small amount of radium found in the water.

It is, of course, important that the bowels should be kept active by the free use of bran and paraffin in addition to a laxative diet. The bowels should move three or four times a day. Most persons afflicted with rheumatism are suffering from colitis or chronic constipation. The tongue must be made clean and the breath sweet.

The skin must be made active and the kidneys must be made to act freely by copious

water drinking. A person should take three or four pints daily. Massage of the joints and applications of electricity, electric light baths and tonic cold rubbings are of great service as curative measures.

Deforming rheumatism, sometimes known as rheumatic gout, rheumatoid arthritis or osteo-arthritis is a degenerative disease and cannot often be entirely cured, though it may generally be arrested. The best measures are those above mentioned as adapted to the treatment of rheumatism. The changes in bones and cartilages which accompany this form of rheumatism cannot be influenced by treatment. The soreness and pain in the joints can usually be relieved by hot applications and the use of the heating compress.

Stiff Joints

Q. **What can be done for stiff joints? Can the motion be restored?**

A. There are two classes of stiff joints: I. Those in which the stiffness is due to adhesions in or around the joint, to adhesions or contractions of muscles, to a floating cartilage in the joint or to growths due to osteo-arthritis or rheumatic gout. 2. Those in which the ends of the bones forming the joints have become joined together by bony union as a single bone. The condition of the joint may be determined by an x-ray examination.

In cases of the first class, motion can usually be restored to the joint either by fomentations (see index), massage and passive movements or by mobilizing the joint under anesthesia. Mobilization should not be attempted in cases in which

the stiffness is due to tuberculous disease, in cases in which there is much heat without fluid in the joint, nor in cases in which the muscles are rigid or adherent.

Any joint which is not absolutely stiff, which is not hot and contains no fluid may be forcibly mobilized under anesthesia without risk.

A few surgeons have succeeded in restoring motion to joints which have been destroyed by union of the bones, but such joints are usually weak and troublesome and the results have been on the whole disappointing.

Acute Rheumatism

Q. **What are the dangers from acute rheumatism and what can be done?**

A. Acute rheumatism is rarely immediately fatal, but sometimes leaves the victim with difficulties which, sooner or later, terminate his life. This occurs whenever the heart becomes affected by the disease, which not infrequently happens. It does not result from a change of the seat of the malady from the joints to the heart, as is sometimes thought, but by an extension of the disease to the lining membrane of the heart. In consequence of inflammation, the valves of the heart become thickened and contracted so that valvular organic disease of the heart results; rheumatism, indeed, is the most common cause of this form of heart disease. The extension of the disease to the heart is indicated by the occurrence of acute pain in the left side, disturbance of the pulse, increase of fever, and increased frequency of respiration. Either one or all the joints in the body may participate in

the inflammation. The joints are generally affected symmetrically; that is, the ankles, wrist, knees, elbows, or shoulders will be affected on both sides at the same time. When this is not the case, analogous joints upon the same side are likely to be affected, as the ankle and wrist, the knee and elbow, the hip and shoulder, etc. Sometimes the disease appears to be very fickle, changing constantly from one joint to another without any apparent cause, the change taking place within a few hours.

Anything which lowers vital resistance will, of course, predispose to rheumatism. Meat-eating, beer-drinking, the use of tea and coffee, excessive eating, exposure of the body to prolonged chilling when perspiring or in a state of fatigue, and neglect of the bowels, are among the most potent predisposing and active causes of the disease.

Eminent authorities agree that medicines have little or no effect in shortening the course of this disease. It has been shown that a person suffering from rheumatism with rest and proper care usually recovers without any treatment. But there can be no doubt that many things can be done for the patient that will tend greatly to shorten the course of the disease and give very great relief from the suffering incident to the painful malady.

A rheumatism patient should first of all be provided with a suitable bed. This should consist of a soft, smooth mattress, preferably cotton or hair, or better still an air mattress. He should be provided with a woolen gown and with perhaps a woolen cape to protect the

shoulders in addition. Linen or cotton sheets should be replaced by woolen sheets so that the patient will be less likely to chill after perspiring. It has been noted that in this disease there is apparently an over-production of lactic acid, much of which is excreted by the skin, causing the perspiration to become acid. The tendency to perspiration should be encouraged by frequent sweating baths. The affected joints should be kept as quiet as possible. In case the knee or elbow joints are affected, it is a good plan to place the limb upon a splint and so avoid motion of the painful joint.

Cancer

Q. **What is cancer?**

A. Cancer is a general term, like fever. The morbid growths to which the term cancer is commonly applied differ much in character as well as in appearance. Growths which recur when they are removed, or which show a tendency to invade the tissues and to develop similar growths in different parts of the body, are known as malignant as distinguished from benign growths which do not invade the tissues, but are generally enclosed within capsules, and purely local growths which, when removed do not recur. Malignant growths include quite a large family of neoplasms (new growths) which are recognizable by their microscopic structure and often also by their gross appearance. The different forms of cancer or malignant disease differ in the degree of their malignancy or tendency to recurrence and some forms are much more curable than others. Skin

cancer for example, or epithelioma, when confined to the skin is almost certainly curable by any one of several different methods, the best of which are the x-ray, radium, and the application of carbon dioxide ice. Successful treatment of cancer depends upon the application of thoroughgoing measures at the earliest possible stage of the disease. In any case in which there is the slightest ground for the suspicion of cancer an able surgeon should be promptly consulted.

Is Cancer Curable

Q. **Is cancer curable?**

A. Most cancers are at their beginning purely local in character. Early and thorough removal of the disease will doubtless effect a cure in the majority of cases. It should be remembered, however, that the predisposition to cancer remains and hence a new development may occur; consequently simply removing the cancerous growth by surgical operation is not sufficient. The patient must be placed under a special regimen, which means a restricted antitoxic and laxative diet, no flesh foods, out-door life, day and night, and all possible means for building up the resistance of the body.

Cancer Increasing

Q. **Is cancer increasing?**

A. Cancer is undoubtedly on the increase. Within the last fifty years this disease, which was well known, but was rare in its occurrence, has increased in frequency until at the present time it destroys one out of twenty of the total population of the United States. The total

mortality among the civilized people of the world is probably not less than one-half million yearly. And this terrible destruction of life by one of the most horrible and loathsome maladies is steadily increasing.

Cancer Less in Vegetarians

Q. **What are the statistics as to the relative prevalence of cancer among vegetarians and non-vegetarians?**

A. Doctor Williams of Bristol, England, in his work on cancer, gives the results of statistical researches in all civilized countries and such information as is available concerning countries in which statistical records are not kept. Doctor Hoffman, of the Prudential Life Insurance Company, has also published a work in relation to cancer, in which a large number of statistics are given. Careful study of these statistics leaves no room for question that while vegetarians are not absolutely immune in relation to cancer, they are far less subject to this form of degeneration than are flesh eaters. This is true of animals, as well as of men.

How to Prevent Cancer

Q. **What precautions may be taken against cancer?**

A. First of all, one should abstain from flesh foods, since cancer is a disease of flesh eating men and animals. In addition the following facts published by the *International Journal of Surgery* should be kept constantly in mind, especially by women, who are more subject to cancer than are men:

1. "Cancer of the uterus commonly arises between the ages of thirty and fifty.

2. "The normal change of life is never marked by an increase in the menstrual flow. The loss of blood, however slight, between menstrual periods or after the establishment of the menopause, is presumptive evidence of cancer and calls for an immediate, searching examination.

3. "A watery discharge is almost as suggestive as is hemorrhage when occurring late in life.

4. "Pain is a very unreliable guide and does not occur until the disease has advanced beyond the uterus, when it is too late to assure good results.

5. "Loss of flesh does not usually occur until the disease has run half its course.

6. "Pelvic complaints of whatever nature arising late in life, should awaken a suspicion of a possible cancer.

7. "Cancer of the uterus may reach the inoperable stage without giving rise to a single symptom, hence the advisability of submitting to an examination at intervals during the period of life between thirty and fifty years, when the liability of cancer is greatest.

8. "The only hope for cure rests in early recognition and in early removal."

Cancer of Stomach

Q. **Is cancer of the stomach curable?**

A. Nearly forty years ago, Professor Billroth, of Vienna, the famous Austrian surgeon, devised an operation for removal of a portion of the stomach in cases of cancer of this organ. The operation was at first unsuccessful but as a re-

sult of later improvements this operation may now be performed very safely, and when the cancer is still confined to the stomach there is an excellent prospect that the disease will not return; but even if it does return the patient's life may by this operation be very greatly prolonged, the patient being given a number of years of comfortable and useful life even though at the time of the operation the condition was so grave that death must have occurred within a few weeks at the longest.

Cancer of the Stomach in Men and Women

Q. **Do men suffer more from ulcer and cancer of the stomach than do women?**

A. Ulcer of the stomach is increasing in both sexes and, according to the Mortality Statistics, the increase between 1900 and 1915 in men was 42%, while the number of female deaths from ulcer of the stomach increased only 20%. The combined death-rate from ulcer advanced from 2.6 in 100,000 in 1900 to 4.3 in 1915, an increase of 65%.

In searching for the disturbing factor we would naturally inquire for some influence affecting the alimentary canal. Various suggestions have been made by eminent pathologists in an attempt to solve this problem. The latest is the theory brought forward by Dr. William Mayo, who at a Clinical Congress, held in the City of Chicago, in an interesting paper maintained that the cause of the more frequent occurrence of cancer of the stomach in men is irritation resulting from the taking of excessively hot food and drinks.

Here, again, alcohol and tobacco may be incriminated as probable etiological factors in producing an excess of male decedents from ulcer of the stomach. It is well known that both alcohol and tobacco stimulate the activity of the gastric glands, and so lead to an excessive production of hydrochloric acid.

These facts afford at least good ground for placing the alcohol and tobacco habits under suspicion as potent causes of gastric ulcer, and as such responsible for at least the excess of male over female decedents from this cause of death.

Men are much larger consumers of meat than women. Pawlow showed that animal flesh greatly stimulates the glands of the stomach and produces a very high acid gastric juice. An eminent New York gastric specialist maintains that the free use of meat is the principal cause of gastric ulcer. The larger use of meat by men than by women may be one of the controlling factors in producing the excessive male mortality from gastric ulcer.

Many eminent medical authorities now maintain that cancer of the stomach generally originates in simple ulcer, so that gastric ulcer may be, in a certain sense, regarded as the preliminary stage of cancer, or, at least, an open invitation to the development of cancerous disease.

The mortality in 1915 from cancer of the stomach was more than 21,000 in the Registration Area, or more than 30,000 for the whole country, the death-rate from cancer having increased nearly 50% in 15 years, or from 22.5 in 1900 to 31.5 per 100,000 in 1915.

Radium Treatment for Cancer

Q. **Is the treatment of cancer by radium a successful method?**

A. Yes and no. Skin cancers, if taken in hand early, before they have penetrated deeply, that is before they have invaded other structures than the skin are practically always curable by applications of the X-ray. The X-ray method has the great advantage in these cases that it causes the disappearance of the cancerous growth without leaving behind an unsightly scar. This is a matter of special importance in cases of epithelioma affecting the skin of the face, especially the eyelids and nose. Unfortunately, the same favorable results have not been obtained in the treatment of cancer of internal parts. Radium has been proven to be useful even in these cases but has not proven to be a radical cure. In some cases an apparent cure has been accomplished but in the majority of cases the effect of the treatment is only to delay the progress of the disease.

The Cancer Scourge

Q. **What are the causes of cancer and to what extent is it curable?**

A. These questions were ably answered by an address by Dr. W. J. Mayo to employees of the U. S. War Department, from which we quote the following paragraphs:

"Cancer is an abnormal growth of tissue within the body. Certain cells in the embryonic stage fail to develop and perform their normal functions, and multiplication of these useless cells form the tumor. What causes the cells to be

checked in their normal development is not yet known, although there are several plausible theories. But the predisposing conditions which lead to this abnormal growth are known, and may be controlled.

"Thus cancer nearly always forms in some lesion upon the body, such as a wart, a mole, a bruised or infected spot. This lesion becomes irritated, and the growth of abnormal cells begins.

"In spite of popular opinion to the contrary, cancer is not an hereditary disease. Certain families may have tissues which develop cancers more readily than others; but this is only a small factor in the development of the disease. Since one out of every nine women and one out of every thirteen men die of cancer, it is not surprising that often several cases should occur in the same family.

"Equally fallacious is the belief that cancer is contagious, in the sense that it can be carried from one person to another, and there is no proof that it is contagious under any circumstances.

"Certain occupations may lead to the contraction of cancer. Workers in aniline dyes absorb deleterious substances, which get into the urine and sometimes cause cancer of the bladder. Cobalt workers often have cancer of the lungs from the inhalation of irritating particles of cobalt, and workers in tar develop irritations at points where the tar comes into contact with the skin, which may develop into cancer. Soot has an irritating effect on the skin, and the frequency of cancer of the groin among chimney sweeps is proof of this. Those who work in arsenic and its

preparations sometimes absorb enough to over-stimulate the skin, and cancer, especially of the hands and feet, may develop. Persons working with the X-ray often develop dermatitis of the hands, leading to cancer.

"It is probably that a majority of human beings are immune to cancer, that a lesser number possess a partial immunity, while a minority are without the protective agencies which render the lesions harmless. The condition of such persons is described 'precancerous.'

"The potency of chronic irritation in producing cancer has been proved in many ways. For example, in India there are cattle which pull loads by means of ropes passed through holes bored through the base of the horns. Cancer at the base of the horn is very common among these cattle, and is seldom seen in others. A Copenhagen scientist found that rats in certain American sugar warehouses frequently had cancer of the stomach. He learned that these rats ate a kind of cockroach which was infected with a parasite that irritated the stomach of the rats, and he was able to produce cancer in other rats by feeding them on these cockroaches.

"There is abundant evidence that external cancer in man is nearly always caused by some sort of irritation, and scientists believe that internal cancer may often be due to the same cause.

"In parts of China where the head is shaved by the public barbers, the razors used are often dull and full of nicks, and the irritation of this scraping often causes cancer. Chinese men suffer from cancer of the pharynx and esophagus, due to their habit of eating very hot rice, which is

thrown into the mouth forcibly with chop sticks. Chinese women eat after their lords and masters, when the rice is cold, and they never have this kind of cancer. In India much cancer is caused by the chewing of betel nut. In come parts of the country women do not chew the nut, and are free from cancer of the mouth.

"Cancer of the mouth in civilized countries has been greatly reduced by good dentistry. Eighty-five per cent of the cancers of the lip occur in smokers. Formerly clay pipes, which become very hot, were much used, and there has been a notable reduction in the number of cancers of the lip since the clay pipe has gone out of fashion. Smoking, however, is the cause of most cancer of the lip, the tongue, and the floor of the mouth.

"In Khurdistan, India, the natives wear baskets filled with hot coals across their abdomens to protect them from the cold, and more than fifty per cent. of all the cancer in that region forms in the abdomen and groin, while in other countries such cancers are very rare.

"Gall stones, which cause a chronic irritation, are found in 85 per cent of all cases of cancer in the gall-bladder. Locomotive engineers and firemen frequently have cancer of the skin, due to exposure of the heat of the firebox. Cancer of the breast in women is believed to be largely due to the irritation of clothes, and especially of corsets. Among people who leave the breast uncovered, cancer of the breast is extremely rare.

"One-third of all the cancer in civilized men occurs in the stomach, although this is not true of animals or primitive people. It seems not improbable that the taking of very hot food and

drink by civilized people may be the cause of this."

Cancer in Animals

Q. **Does cancer occur in animals?**

A. Yes. Cancer is very common in carnivorous animals.

That cancer affects lower animals as well as human beings has long been known. The cat and the dog, animals which are more carnivorous in their habits than human beings, are even more subject than man to cancer. Thoroughbred dogs in particular are especially prone to this disease, one form of which, known as lymphosarcoma, has become a terror to breeders of dogs with an aristocratic pedigree. Carefully kept statistics of hospitals for diseased animals show that dogs and cats are subject to the disease to the extent of seven per cent, as compared with a proportion of five per cent of human beings.

Another observation is that cancer is most frequent among domesticated fishes, although wild fish are by no means exempt from the disease.

According to the extensive records of the Veterinary Pathological Institute of Berlin, cancer occurs in about six per cent of cats, which is more frequent than in human beings.

Of all animals that have been studied, with the exception of mice, the dog appears to be much the most subject to cancer. Semmer found eight per cent of cancerous dogs in 3,525 dogs examined.

According to Williams, cancer is most common in pet dogs, and occurs most commonly in dogs from five to ten years of age. The most common seat of the disease is the mammary

gland, which was affected in 46 per cent of the cases.

The monkey appears to be, of all animals examined by pathologists, the least liable to cancer. In fact, tumors of all sorts are extremely rare in the monkey. Great numbers of these animals have been studied in the zoological collections of Europe and America, but only two cases have been found in which there was any ground for suspicion of cancer.

According to Dr. Charles Mayo, 25 per cent of all dogs over 10 years of age have cancer; of dogs over 12 years of age one-third have cancer; of dogs over 14 years of age half are cancerous.

Cancer in Plants

Q. **Are plants subject to cancer?**

A. Yes. Professor Edwin F. Smith, of the U. S. Agricultural Department, Washington, D. C., has shown that certain plant growths known as "crown gall" and "hairy root" are undoubtedly of a cancerous nature. He has demonstrated the close resemblance of these growths to cancers in human beings, and has noted the following points of resemblance:

1. Plant cancer is most likely to occur in plants which are overfed. This agrees with the observation of Williams that plant cancer is most common among trees growing in soil which is satuated with sewage and hence has an excess of nitrogen.

2. Plant cancer is a wound infection; that is, the disease is likely to make its appearance at points which have been injured by attacks of insects or other cause.

3. Plant cancers are likely to develop on scars, the result of previous injury.

4. Plant cancer, like human cancer, when removed, is almost certain to reappear.

5. Plant cancer, like human cancer, undergoes metastasis; that is, when cancer develops in some part of the plant, other similar growths are likely to appear in other related parts.

6. Plant cancer, in time, destroys the plant upon which it grows.

7. Plant cancers, like human cancers, frequently break down and become the seat of decay.

Is Tuberculosis Hereditary?

Q. **Do scientific facts sustain the popular view that tuberculosis is hereditary?**

A. No. "Tuberculosis in the true sense of the word is not hereditary. The child is usually infected by its well-meaning but ignorant parents. The mother has kissed the child, taken it into her bed and allowed it to use the same utensils she used herself, and thus unconsciously has conveyed the disease to her infant. Parents may be careless and expectorate on the floor where the child is often placed. Children born to consumptive parents need not necessarily contract the disease. But what consumptive parents do transmit, however, is a predisposition to the disease. This hereditary predisposition is, however, a condition which can be overcome by judicious training, proper food, plenty of outdoor exercise, and the avoidance of all excesses."

Tubercular Germs in Butter and Cheese

Q. **Are the germs of tuberculosis found in butter and cheese?**

A. It has long been known that tubercle germs survive for months in butter and cheese. A recent study of this subject by Schroeder and Brett in which 256 samples were examined, showed that cream cheese is often heavily contaminated with tubercle bacilli of the bovine type.

"Hence cream cheese should be made either from pasteurized milk and cream or from milk and cream obtained from cows which have been proved free from tuberculosis. Cottage and skim milk Neufchatel cheeses are much less frequently infected with tubercle bacilli than cream cheese, but infection is frequent enough to indicate that they should not be made of raw milk."

Tobacco and Tuberculosis

Q. **Does tobacco cause lung consumption?**

A. Probably yes. Records kept at the Phipps Institute for Tuberculosis in Philadelphia show this. The superintendent of this famous institution states in his Annual Report for 1907, p. 36, as follows:

"As with alcohol, so with tobacco, the mortality was much greater among those who used it than among those who did not use it. During the fourth year 18.58% of those who used tobacco died, as compared with 5.15% of those who did not use it; and during the current year 15.30% of those who used tobacco died, as compared with 13.51% of those who did not use it. For the two years the excessive mortality among those who used tobacco over those who did not

use it is as great as the excessive mortality among those who used alcohol over those who did not use it."

Major Gerald B. Webb, of Colorado Springs, Colorado, has called attention to the fact that ronchi are constantly present in the bronchi of smokers.

In view of the fact that practically all adults, both men and women, are infected with tuberculosis, and the showing made by the Phipps Institute, that infected smokers have scarcely one-third as good a chance to survive as infected non-smokers, it must be admitted that the increased use of tobacco is largely responsible for the greater mortality of men from lung tuberculosis.

The Curability of Tuberculosis

Q. **Is tuberculosis curable?**

A. Yes. Within the last fifty years wonderful progress has been made in the treatment of cases of tuberculosis. It is now known that even where the disease is fairly well advanced a practical cure may be accomplished in the majority of cases.

In sanatoria where the best methods are employed, the proportion of recoveries is reported to be about sixty per cent. It should be said in this connection, however, that only hopeful cases are received. Advanced cases are not accepted for treatment.

It is of the highest importance that in every existing case of tuberculosis measures should be taken for the protection of other members of the

family who are not yet infected and to give the infected person every possible chance for recovery. In the writer's opinion advanced cases of tuberculosis and all so-called cases of open tuberculosis, that is, cases in which the sputum contains tubercle germs, should be placed under quarantine the same as persons suffering from leprosy and other infectious diseases. When the necessary isolation can be secured in the patient's own home this may be done but otherwise the patient should be placed in a hospital where the necessary care may be received.

It is quite impossible, however, to deal with this great plague by the hospital plan alone. Each year one hundred and fifty thousand people die of this disease. For each one that dies there are, according to our best authorities, eight living persons suffering from the same malady; hence there are to be found in the United States not less than one million two hundred thousand persons suffering from tuberculosis, or more than one per cent of the entire population. It is impossible to gather all these persons into hospitals; they must be dealt with in their own homes. In every case in which a person suffering from tuberculosis is found in a family, the entire family should be taken under care and treatment. When a father or mother is infected by the disease most of the other members of the family are likely to be infected by the disease and will sooner or later show characteristic symptoms.

Early Diagnosis of Tuberculosis

Q. **How may tuberculosis be known at the outset?**

A. Since consumption is so difficult of cure in its advanced stages it is important to know if there is any means by which the disease may be discovered in its incipiency. The physical diagnosis has been so far perfected that it is now possible for well trained experts to discover the very beginnings of tubercular disease even in the absence of cough, emaciation and other prominent symptoms which characterize the more advanced stages of this grave malady. Such experts are, however, comparatively few in number, but the recent advances in the methods of x-ray examinations have made it possible for a good roentgenologist to discover the earliest beginnings of the disease and also to discover evidences of old diseased processes which have passed through their various stages and finally healed.

Symptoms of Tuberculosis

Q. **What are the ordinary symptoms of tuberculosis which a patient may himself observe?**

A. Among the first symptoms are loss of flesh, loss of strength, a feeling of lassitude, a slight fever in the afternoon or evening, often perspiration at night and slight cough; later, expectoration and perhaps a hemorrhage from the lungs. If the disease is sufficiently advanced examination of the sputum by a bacteriologist shows the presence of tubercule germs. One

should never wait until germs can be found in the sputum as this symptom indicates that the disease is so far advanced that ulceration or breaking down of the lungs has begun.

Hydrotherapy in Tuberculosis

Q. **Is hydrotherapy beneficial in tuberculosis?**

A. Hydrotherapy is not only a powerful ally of the open-air treatment of pulmonary tuberculosis, acting as an adjunct to exercise, sunlight, cold or cool air, proper diet, and other hygienic conditions and physiological measures, but it is actually indispensable in a large number of cases in which the patient is so feeble, either from loss of blood or reduction of strength or some other cause, that the advantages of the open-air method are only in a small part available.

In these cases hydriatic measures properly adapted to individual cases serve as a substitute for cold air and exercise, and have the advantage over both these measures in the fact that they are capable of absolute regulation and graduation, awakening within the system the same reactions, more or less ample and intense, as may be desired, and thus serving as a means by which the patient may be lifted from a state of utter helplessness by daily increments of energy until he becomes capable of utilizing with advantage more vigorous measures.

Rules for Tuberculosis Patients

Q. **What rules should be followed by a person suffering from tuberculosis?**

A. The following rules were formulated by a health official, who has many consumptives under his care.

The tuberculous patient must consider his own welfare as well as the welfare of those about him.

He should be in the fresh air as much as possible night and day.

He should be cheerful, look on the bright side of life.

He should eat only nourishing food.

He should avoid style, dress to suit the changes in the weather, always carry an overcoat and two or three handkerchiefs.

He should keep his nose, mouth and hands clean and free from infection.

He should take at least nine hours of sleep at night, and if possible a nap in the afternoon.

He should not mingle in large crowds of people or be where there is dust or smoke.

He should not take tobacco or alcohol in any form.

He should not cough needlessly, but only when he feels he must expectorate.

He should not work when feeling ill.

He should never swallow his sputum, as it may cause tuberculosis of the bowels.

He should not spit anywhere except in ves-

sels for that purpose or in paper napkins, which should always be burned.

He should not cough or sneeze without covering mouth and nose with handkerchief.

He should not kiss any person.

Bovine Tuberculosis

Q. **Is bovine tuberculosis dangerous for human beings?**

A. It was discovered some years ago that tuberculosis germs from which cows suffer differ slightly from the human variety. It was at first supposed that on this account human beings would not be likely to contract disease from cattle, but it is now known that this is an error.

Hess, a New York investigator, found among eighteen children fed on cow's milk five suffering from tuberculosis. Behring has demonstrated that among young children in cities twenty-four out of twenty-five are infected from tuberculosis in some form. Other observers have found as high as twenty-five per cent of cases of tuberculosis in children due to bovine infection. It is estimated by Rosenberg that not less than 500 children die every year from bovine tuberculosis in New York City alone.

Investigations made in Washington, Rochester and New Haven have shown the presence of tuberculosis germs in milk to the extent of twenty per cent of all specimens obtained. The Health Department of Boston found that twenty to twenty-five per cent of the animals furnishing

milk to the city were infected with the germs of tuberculosis.

Of five thousand cows that are brought to the city abattoirs for slaughter every year, fully one thousand were found to be so badly diseased as to be unfit for food, yet these same cows a short time before they were turned over to the butcher were supplying milk to the city of Boston and surrounding towns.

It has been demonstrated that tubercle germs are not only found in milk but survive in butter and cheese.

Common Colds Due to Infection

Q. **Is it positively known that colds are due to infection?**

A. Foster, by careful experimentation, has shown that common colds are infectious. Heretofore search for the infecting bacteria has failed to discover it, for the reason now shown that the organism is too small to be seen by the microscope. It is so exceedingly minute that it even passes through a porcelain filter. Nevertheless, this very small organism may be cultivated, and is found virulent in the second generation so that its specific character is established.

The same precautions may be taken with advantage against common colds as against influenza and other well-known contagious and infectious maladies.

When the great number of inconveniences and even grave injuries to important vital organs which may be traced to an ordinary cold are considered, it becomes evident that this malady ought to be placed upon the list of avoidable diseases

and that measures should be taken toward its suppression.

Nasal Catarrh

Q. **Is nasal catarrh curable?**

A. Nasal catarrh is usually curable, but the cure is by no means an easy or simple matter. There is no such thing as a successful "catarrh remedy." The numerous advertised nostrums are all mere "catch-penny" schemes, and some are positively harmful.

In the majority of cases there are conditions in the nose which require the special attention of an expert. Bones become thickened, mucous surfaces are swollen, and drainage passages become obstructed, retaining infectious material. The cavities of the facial bones connected with the nasal cavity become infected, thus maintaining a condition of chronic infection.

In every case of chronic nasal catarrh a competent nose specialist should be consulted. The wonderful advances made in the treatment of disorders of the nose within the last quarter of a century make it possible now to effect a cure in practically every case of chronic catarrh in which the disease has not existed so long as to cause extensive destruction of the mucous membrane or other structures of the nose.

Treatment of Nasal Catarrh

Q. **What is the best method of cleansing the nose in nasal catarrh?**

A. The first thing necessary, in the local treatment of chronic nasal catarrh, is thorough cleansing of the nose by artificial means. This

may be best accomplished by means of an atomizer giving a strong spray.

A salt solution consisting of a teaspoonful of salt to a pint of water, or a salt and soda solution consisting of one teaspoonful each of salt and soda, may be used for this purpose.

The salt and soda solution is somewhat more effective than the salt solution alone. The atomizer should be used first in each nostril, then at the back of the throat. Care should be taken to place the end of the atomizer tube behind the soft palate, so as to apply the spray thoroughly to the back part of this cavity.

After a thorough cleansing of the nasal cavity, use some antiseptic preparation dissolved in oil. The following formula to be used with an atomizer will give excellent results:

Menthol	5 gr.
Camphor	10 gr.
Liquid petroleum..............	4 oz.

The extension of the disease to the ear and other parts must of course be treated as may be demanded by the particular case in hand. In some cases no method of treatment seems to work successfully, and the patient apparently derives no benefit from anything except change of climate; but we have never yet met with a case so bad that it could not be benefited by a strict compliance with the rules laid down and a thorough employment of the measures mentioned.

In recent years there have been very great advances in the surgery of the nose. It is now known that in many cases of chronic catarrh the continuance of the disease is the result of

malformations in the nose, especially the overgrowth of certain parts, causing retention and decomposition of the nasal secretions. These conditions may be promptly remedied by simple surgery.

Adenoids

Q. **What are adenoids and should they be removed?**

A. Adenoids are growths which form in the upper part of the pharynx and at the back part of the nasal cavity. They are likely to produce serious injury by obstruction of the nostrils and may lead to deafness, to deformity of the jaws, an abnormal expression of the face, and may even produce mental and nervous disturbances of a serious character.

Adenoids are usually considered an indication of mal-nutrition. They are doubtless the result of the attacks of bacteria upon the mucous membrane and a state of low resistance.

Adenoids should be removed as soon as discovered. They always do more or less harm and can do no possible good. The operation is a simple one; it is nothing more than scraping off the diseased mucous membrane with a suitable instrument. The operation should be done by a specialist in disorders of the nose or throat.

The presence of adenoids is evidence of a depressed vital state (low resistance) and hence attention must be given to building up the general health of the child by proper diet, daily out-of-door exercise, sleeping in out-of-door air and correct diet. The open air school room is

essential for such children. Meats should be discarded from the dietary along with condiments of all sorts. Instead of the popular breakfast foods, feed the child oatmeal, (steel-cut oats) cooked six to eight minutes only and add to the oatmeal one-third its bulk of cooked wheat bran. Have the child eat a large dessert spoonful of cooked bran at every meal together with fruits and vegetables which should constitute the chief part of the diet. Greens of all kinds are especially beneficial. Care should be taken to see that the bowels move well three or four times a day. The tongue must be kept clean and the breath sweet. Use paraffin if necessary to keep the bowels active; two or three teaspoonfuls of paraffin oil at each meal or better half a paraffin tablet. An emulsion of paraffin oil, "Paralax" is an agreeable form to which children seldom object.

Buzzing or Ringing in the Ears

Q. **What causes buzzing in the ears and what will cure it?**

A. Buzzing or ringing in the ears is a very common symptom associated with nasal catarrh and most generally indicated that the disease is extending up the Eustachian tubes into the middle ear. An ear specialist should be consulted. If neglected, deafness may result. Ringing in the ears is sometimes present in anemia and in cases of neurasthenia.

Nose Discharge

Q. **What causes a discharge from the nose?**

A. Infection with pus-forming bacteria. When an offensive discharge is persistent, there is generally infection of some of the cavities or sinuses connected with the nasal cavity. A nose specialist should be consulted. Avoid advertising quacks.

Mucus in Nose and Throat

Q. **What is the best way to prevent the formation of the mucus that accumulates in the back part of the nose and drops into the throat?**

A. Thorough treatment by a specialist will effect a cure. There is no simple remedy for this condition. One of the best home remedies is the inhalation of steam.

Causes of Deafness

Q. **What are the causes of deafness?**

A. In ninety-five per cent of all cases the cause of deafness is catarrh which begins in the throat and nose, and which has been neglected until it extended up into the ears. Enlarged tonsils, snoring, sleeping with the mouth open, are indications of the presence of catarrh.

The Nasal Douche

Q. **Is the nasal douche a good remedy for nasal catarrh?**

A. The nasal douche is no longer recommended. It frequently does mischief by carrying the infectious discharges of the nose into the ears and other cavities, and so doing great harm. As a matter of fact, it is not necessary in

any case. An atomizer giving a strong, coarse spray is useful in some cases in which there is a profuse nasal discharge, and especially in those cases in which dry scabs form in the nose. A solution consisting of one teaspoonful of common salt and a teaspoonful of soda in a pint of distilled water is excellent as a nasal cleansing agent when used with an atomizer giving a strong, coarse spray. Use twice daily.

Nasal Discharge

Q. **What are the yellow plugs blown from the nose, and what can one do to get rid of them?**

A. These masses consist of dried or partly dried mucus containing great numbers of white blood cells and countless numbers of pus-producing bacteria. The crusts which are formed in the nose should be loosened and thoroughly removed twice daily by the application of a solution made by adding to a pint of water, one dram each of common salt, bicarbonate of soda and boracic acid. An atomizer giving a strong spray should be used, so that the nasal cavity may be thoroughly flooded, and the application should be continued until the passages are quite free. Then an antiseptic solution should be applied. A solution consisting of ten grains of eucalyptol to one ounce of petroleum oil or albolene is very useful for the purpose. If possible, consult a good nose specialist, as there may be some narrowing of the nasal passages which requires the attention of a specialist.

Catarrh Contagious

Q. **Is catarrh contagious, and if so how?**

A. Yes; and the fingers are a common means of infecting the nose. It is surprising how often the fingers visit the nose and mouth. This is especially true of children and even adults who have missed proper training in this particular. The fingers are often moistened with saliva for various purposes. If the saliva were green or blue, the fingers would constantly show evidence of being soiled with this secretion. By this means one may infect things and persons with his saliva and may in turn infect his own mouth with germs from many sources. As Doctor Chapin has pointed out: "The cook spreads his saliva on the muffins and rolls, the waitress infects the glasses and spoons, the moistened fingers of the peddler arrange his fruit, the milkman's thumb is in his measure, the reader moistens the pages of his book, the conductor, his transfer tickets, the lady, the fingers of her glove. Every one is busily engaged in this distribution of saliva, so that the end of each day finds this secretion freely distributed on the doors, window sills, furniture and playthings in the home, the straps of trolley cars, the rails and counters and desks of shops and public buildings, and indeed upon everything that the hands of man touch." The saliva is always infectious.

Dry Catarrh

Q. **Is dry catarrh curable?**

A. So-called dry catarrh is a condition in which the secreting glands of the mucous membrane of the nose have degenerated and in part disappeared, the result of long continued inflammation and infection. There are two kinds of these glands, those that secrete serum, and those that form mucus. The serous glands disappear first. The result is that the thick mucous secretion accumulates and forms dry hard masses which decompose and cause erosions of the mucous membrane and finally ulcerations and after some years even serious destruction of the nose. This condition is accompanied by a very bad odor of the breath, and often bleeding at the nose. There is an uncombortable dryness of the nasal passages and of the throat due to the enlarged space resulting from atrophy of the mucous membrane.

The complete cure of this condition is of course not possible, but much can be done to relieve its inconveniences. By daily cleansing and disinfection of the nose, the fetor of the breath may be largely removed. By application of a spray of vaseline, the sense of dryness may be relieved. It is sometimes wise to introduce into the widened nasal passages plugs of cotton to diminish the size of the inlet. Every case of this sort should be placed, for a time at least, under the care of a good nose specialist.

A notable fact about nasal catarrh is that the disease is confined to house dwellers. Wild people, who live in the open, do not suffer from nasal catarrh. The same is true of civilized men and

women who live in the open air. Explorers and soldiers in the field suffer little or not at all from colds and catarrh. These are house diseases like pulmonary tuberculosis.

Many years ago the writer visited the tribe of Yuma Indians living about the old Fort Yuma who at that time lived in their original primitive simplicity. The men wore the G-string and the women little bark aprons. The children were wholly nude. Catarrh was unknown. Some of the children had been gathered into a school and were clothed. These all suffered from catarrh. On inquiry, it was learned that the Indian parents attributed the catarrh to the wearing of clothes.

Coryza—Acute Nasal Catarrh

Q. **What is the best treatment for one who on taking cold suffers for a day or two with excessive running of watery mucus from the nose?**

A. Coryza, or cold in the head, is one of the most common of all affections. It is due to an infection of the mucous membrane of the nasal cavity. Colds are catching, like diphtheria and small-pox. The treatment consists of rest, dietetic regulation, and training of the skin. A vapor bath, sitz bath, short hot tub bath, fomentations to the forehead and face give relief. This treatment should be taken at night just before retiring. If taken in the daytime the patient should not go out of doors or expose himself to drafts for some hours afterward.

The inhalation of steam with an electric vapor thermophore is the best means of combating the local pain and inflammation.

The susceptibility to cold is best relieved by a course of treatment to harden the skin. The most efficient measure is the frequent use of cooling baths, such as a cool spray, cool sponge bath, or cold mitten friction. A cold bath is best taken immediately on arising in the morning. The popular idea that a cold is a matter of small consequence and needs little attention, as the patient will recover without treatment, is an erroneous one. Colds, when left to themselves, nearly always leave the affected parts in a more or less diseased condition. Out-of-door life and open-air sleeping are the best preventives against cold. Persons whose bowels move three times a day seldom take cold because they have high resistance.

Another way to cure a cold is to take no bath at all or a short very cold bath, drink plenty of water, go out of doors and stay there until the cold is cured. If one lives out-of-doors entirely he will get rid of the cold in the cold air, because the breathing of fresh cold air increases his body resistance. It goes without saying that the patient must keep warm during the outdoor treatment, either by vigorous exercise or by being properly protected with wraps and blankets.

"Cold in the Head" in Infants

Q. **What will relieve cough and cold in the head of an infant?**

A. Apply a cold wet hand rub daily. Keep the child out of doors constantly. Expose the skin to the sun and air for a half hour, two or three times a day. Apply to the nose the follow-

ing solution with an atomizer: Menthol, 20 grs.; camphor, 10 grs.; thymol, 2 grs.; alboline, 4 ozs.

Every cold in the head or acute nasal catarrh should be treated promptly and thoroughly. When neglected, a cold is likely to become chronic, a condition of nasal catarrh. Nasal polypi obstructions, deafness and painful affections of the cavities in the facial bones are natural consequences of neglected colds.

Loss of Voice

Q. **Please indicate the cause of the loss of the voice.**

A. The loss of the voice may be due to an inflammation of the mucous membrane of the larynx or to an infection of the nerves controlling the laryngeal muscles. A loss of voice is sometimes due to hysteria. In such cases the voice may be suddenly recovered at any time.

Loss of voice is sometimes the result of infection of the larynx with tuberculosis. Either one or both of the vocal cords may be affected.

Syphilis is another common cause of loss of the voice.

Cancer and tumors of various sorts may develop in the larynx so as to cause loss of power to make vocal sounds.

In cases in which it has become necessary to remove the larynx by a surgical operation, it has been found possible to restore the power of vocal speech by means of the insertion of a tube containing an organ reed. The voice produced in this way is of course a monotone.

Nasal Tone of Voice

Q. **How can the habit of "talking through the nose" be overcome?**

A. Of course, no one talks through the nose. The peculiar style of talking to which this term has been applied, is due to obstruction of the nostrils, so that it is really talking without the nose instead of through the nose. It is not merely a habit; it is generally due to disease. The remedy is to be found in removing the obstruction from the nose. The obstruction may consist of polypi or other growths, or a mere thickening of the mucous membrane. A good specialist should be consulted.

Clergyman's Sore Throat

Q. **What is the cause of the pharynx becoming dry, accompanied by a weak and easily tired voice followed by hoarseness?**

A. This condition is probably due to chronic pharyngitis. Acute and chronic catarrh of the pharynx are among the most common of all the forms of catarrhal disease. What is known as "clergyman's sore throat" is a variety of pharyngeal catarrh. Bad dietetic habits are an important factor in causing this condition.

The use of mustard, pepper, peppersauce, ginger, vinegar, and various other condiments, and the excessive use of salt, sugar, fats, and animal food must be set down among the predisposing causes. The disease is especially common in persons of sedentary habits. An out-of-door life, "The simple life" in all respects is a pretty certain preventive of this disease and a good measure of treatment.

The Tonsils

Q. **Of what use are the tonsils and should they be removed?**

A. The tonsils are lymphatic glands. Their function is to protect the body against the great number of microbes which collect in the mouth. They are also connected with the functions which promote the growth and development of the body.

Diseased tonsils are a constant menace to the body, proving an open door for the entrance of harmful organisms. Tuberculosis germs and other disease-producing bacteria often find their way into the body through the open portal provided by diseased tonsils. The tonsils harbor disease germs, such as pneumonia and diphtheria, also the germ of influenza or la grippe. These germs are lying there ready to develop whenever the vital resistance is lowered by cold, exhaustion, indigestion, or any other depressing cause. Diseased tonsils are often a cause of rheumatism and probably other serious maladies.

Tonsils which frequently become raw or inflamed or which are constantly enlarged with pockets full of pus should be promptly removed.

The question is often asked, Will not removal of the tonsils change the voice or spoil the singing or speaking voice? The operation will change the voice. It will improve it. The tonsil should not be removed unless so badly diseased that it has ceased to be of any value to the body and has become a source of injury.

Inflammed Tonsils and Rheumatism

Q. **Will inflammation of the tonsils lead to rheumatism?**

A. Murray in 1901 found in the mucous covering the tonsil streptococci, which, when injected caused inflammation of the points and the valves of the heart.

Recent studies have shown that chronic inflammation of the tonsils is very frequently the cause of rheumatism and one that should be looked for in persons suffering from acute rheumatic troubles.

If the tonsils are found to be diseased they should be thoroughly removed. Partial removal is not sufficient. The entire tonsils should be enucleated in order to insure complete relief.

Chronic Laryngitis

Q. **Is chronic catarrh of the larynx curable?**

A. In most cases this disease may be cured. even when of long standing, except in cases in which the inflammation is due to tubercular infection. Many of these cases are also curable if taken in time. A skilled specialist must be consulted.

Sore Throat

Q. **What is a good remedy for sore throat?**

A. There are many remedies for sore throat, some of which are harmless, being simply worthless,—like goose-oil applied externally,—while others are quite injurious. The best remedy is hot water. It should be applied outside and inside; outside by means of fomentations (see index) for fifteen minutes or half an hour twice a day; inside by a gargle of hot water,

as hot as can be borne, every fifteen minutes or half hour until relieved. Drink plenty of hot water, so as to get into a profuse perspiration. If there is fever, cool the skin with sponge-baths. Keep the feet warm. If the symptoms are severe, apply ice in a bag to the outside of the neck, and give the patient little pieces of ice to swallow. A few hours of this treatment will effect a cure in simple cases.

The inhaling of steam is a most efficient means of relieving pain and combating inflammation in cases of acute inflammation of the throat.

Breast Hardening

Q. **What should be done for the lumps which sometimes form in the breast especially about the time of the menopause?**

A. When painful lumps are found in the breast a competent surgeon should be consulted. Lumps which grow or which cause retraction of the nipple, should be removed at once.

Lumps in the breast are always to be regarded with suspicion as they are very liable to become cancerous. They are probably due to chronic inflammation the result of autointoxication. The heating compress and daily exposure to the sun's rays or an arc light are useful measures for relief.

Artificial Respiration

Q. **What is the best method of administering artificial respiration?**

A. One of the best methods is known as the Sylvester method.

After clearing the mouth of dirt and saliva, and drawing the tongue forward, the patient is

laid upon the back with the shoulders and head slightly raised. The operator then kneels behind his head, grasps the arms just above the elbows, and draws them steadily upward until they meet above the head. By this means, the ribs are elevated, and inspiration is produced. The arms are then brought down to the sides of the chest, the ribs being compressed against the lungs, so as to produce expiration. These movements are to be repeated twelve to sixteen times a minute.

Asthma

Q. **What is the cause of asthma? Can it be cured?**

A. Asthma is generally curable. There are at least three kinds of asthma. One kind is due to intestinal toxemia. Poisons absorbed from the colon, excreted through the lungs, irritate the small air passages and cause them to contract and produce a spasm, so that the inhaled air cannot be readily gotten out of the lungs.

Another form which is less common is due to bronchial catarrh, which causes irritation of the small air passages and causes them to contract.

Still another form is due to a diseased condition of the heart so that the organ is not able to carry the blood away from the lungs and they become congested.

All of these conditions may be relieved. Asthma due to disease of the colon can be cured in a short time. Asthma due to bronchial catarrh is also usually amenable to treatment. Asthma which is due to heart disease may be helped, but cannot always be cured.

Asthma may also be caused by the inhalation of the pollen of plants (hay asthma) or to other poisons or foods to which the individual may have been sensitized.

Artificial Light

Q. **What kind of artificial light is best for the eyes?**

A. A soft diffused light. Brilliant light should never fall directly upon the eye, especially when reading, or at work.

Artificial Lighting and Eye Disease

Q. **Is it probable that modern methods of artificial lighting are the cause of the apparent increase of eye disease in recent times?**

A. It is probable that certain forms of artificial light are highly injurious to the eyes. Scientific experiment has shown that a combination of red and yellow rays are most agreeable, and least injurious, to the eye. The light furnished by the old fashioned candle and the kerosene lamp was most wholesome for the eye as regards quality, although frequently deficient in quantity. White light contains actinic rays, which are pernicious, and light which is capable of producing tanning of the skin is unquestionably injurious to the eyes. It has been found that workmen in glass factories, and other industries in which the eyes are constantly exposed to bright light are very subject to cataract. It is quite possible that the great brilliancy of the most improved forms of lamps now used in house lighting may be responsible for many cases of cataract and other forms of

eye disease. The indirect and semi-indirect systems of lighting are unquestionably a very great improvement, since they serve to protect the eye from the brilliant rays of the incandescent film.

Eye Lotion

Q. **Is borax solution good for inflamed eyes?**

A. No. Borax is often useful as a skin lotion but should not be used for the eyes. Boracic acid is highly useful, as has been long known; but in borax the acid is combined with an irritating alkali and so borax should not be used in applications to so delicate a surface as the mucous membrane of the eye. A saturated solution of boracic acid dropped into the eye several times a day is highly useful for inflamed eyelids.

Acidosis

Q. **What is acidosis?**

A. Acidosis relates to a condition of the body in which acids are predominant. Under normal conditions the fluids of the body are neutral. In certain conditions of disease the normal balance is destroyed. This condition is very commonly present in many forms of chronic disease, such as Bright's disease, which some eminent authorities believe to be due to an over accumulation of acids in the tissues. There are two forms of acidosis, true acidosis and relative acidosis. True acidosis is a condition in which acids have accumulated in the body to so great an extent that they can no longer be neutralized, while relative acidosis is not due to the accumulation of acids, but rather to loss of

alkalies. Relative acidosis is a condition almost wholly confined to children in whom it sometimes though rarely occurs as a result of acid fermentations in the intestines. The source of these acid fermentations is an excess of fat in the food. The fats ferment, producing butyric acid. The body produces alkalies to neutralize the acids and thus the body is robbed of its alkaline substances. The condition of relative acidosis sometimes occurs also as a result of diarrhea in which the alkalies of the body are discharged more rapidly than they can be replaced.

Acetone in the Breath

Q. **What is the cause of acetone in the breath?**

A. Acetone found in the breath and urine, especially in diabetes, is the result of imperfect burning of fat.

It is on this account that great care must be taken in feeding diabetics to avoid giving an excess of fat, although, of course it is necessary that the amount of fat should be very greatly increased in many cases of diabetes in which it is often necessary to give the patient three times the amount of fat called for by the standard ration.

Air-Swallowing

Q. **What is the cause of air-swallowing?**

A. The habit of swallowing air was formerly supposed to be very rare. It is now known that most people who think they are suffering from gas on the stomach are really addicted to the habit of swallowing air. Discomfort in the stomach gives rise to a peculiar muscular

movement, as a result of which air is drawn down into the stomach. The patient thinks that he is expelling gas from the stomach when the real fact is that he is filling his stomach up with air by swallowing it. At intervals the accumulated air will be belched out of the stomach and then the swallowing will begin again. The best means of temporary relief is to open the mouth wide and take deep breaths. It is a good plan to swallow one or two glassfuls of hot water. Air swallowing is frequently a habit which can be broken only by a strong effort of the will.

Bronchitis

Q. **What is the cause of bronchitis?**

A. Chronic bronchial catarrh is most frequently the result of constipation. The poisons absorbed from the colon are eliminated through the lungs and irritate the mucous membrane, giving rise to an increased secretion. The vital resistance is at the same time lowered, by which means the growth of germs in the air passage is encouraged. The greatest benefit is likely to be derived from securing three thorough movements of the bowels daily by natural and unirritating means, by proper regulation of the diet, discarding flesh foods of all kinds, and by building up the general health in every possible way.

In most cases of chronic bronchitis the skin is dingy or pigmented, the tongue coated, the breath bad, and there are many other evidences of intestinal toxemia or auto-intoxication. This condition must be cured by change of diet and increased bowel activity. The skin may be improved by the electric light bath three or four

times a week, followed by cold friction, the air bath and oil rubbing every day and sun bathing when possible.

The chest pack is one of the best measures of relieving the cough. To encourage expectoration, use the chest pack at night or even night and day, and drink hot water freely, three or four pints during the day. A non-flesh diet is essential; also the avoidance of condiments, and salt should be used very sparingly, the less the better.

Burns

Q. **What is the best method of treating burns?**

A. Slight burns in which the skin is not broken are best treated by the application of talcum powder, bismuth or powdered alum. In cases in which much pain is present relief may be obtained by applying a compress wet with two to five per cent of subacetate of aluminum. When the pain is relieved the compress should be removed and powder applied. In a few days the skin peels off and the parts rapidly become normal. In more severe burns in which the skin is badly blistered there is always much pain. Compresses with the aluminum subacetate solution should be constantly applied. The compresses should not be allowed to get dry. Cheese cloth is the best material. It should be laid over the affected parts and kept constantly moist with the solution. To prevent drying the compress is covered with oiled silk or muslin. Avoid the use of carron oil, ointments, and other greasy preparations. Blisters, when distended with serum, should be carefully punc-

tured and shreds of tissue and skin should be removed. When the pain is relieved and the healing process begun it is found to be advantageous to expose the parts to the air without covering for one to three hours daily. Dry talcum powder or bismuth is then sprinkled over the rough surface and a sterilized gauze compress is applied. Burns usually recover in a week or ten days. Later, to prevent formation of crusts, vaselin containing two or three per cent of boric acid may be applied. In very bad burns in which the injury extends to a considerable depth, cheese cloth compresses wet with a solution of aluminum subacetate should be constantly used until the dead parts separate. The line of division between the live and the dead tissues will usually appear by the third or fourth day. Care should be taken to avoid tearing away the dead parts so as to induce bleeding as this will cause opening of the blood vessels and infection. If there is much pus formation and fever, a compress wet in a solution of bichloride, one part to two thousand may be usefully employed. After a healthy granular surface appears, the healing may be greatly encouraged by skin grafting. After grafts are applied the wound should be exposed to the air for one to three hours every day. The exposure to the air forms a slight dry film under which the newly formed tissue develops rapidly. After exposure to the air lint covered with vaselin containing two per cent boric acid is applied to prevent the formation of crusts. When a large surface is involved it is a good plan to cover the raw surface with gutta percha tissue

in which numerous holes are made to allow the escape of serum; over this is applied a cheese-cloth compress, which is kept moistened with a solution containing three to five per cent of common salt and one per cent of citrate of soda. Old sores resulting from burns may be stimulated to rapid healing by exposure to the direct sunlight or arc light rays for an hour daily.

A new method of treating burns has been developed recently in one of the field hospitals of France. The method consists of spraying the burned surface with a preparation consisting of paraffin molding wax or resin in solution. A mixture of paraffin oil and paraffin wax equal parts works nearly as well as the proprietary preparation. It is heated to 150 F. by putting the container in hot water, and is applied with an atomizer after carefully cleansing and drying the burned surface. After the first layer has been applied, a thin layer of cotton is put on and then more of the paraffin is sprayed on. It is applied twice a day. The results are most excellent.

A ten per cent solution of picric acid in water is an excellent remedy for slight burns. This solution relieves pain and protects the part from the contact of the air.

Car Sickness

Q. **How may car sickness be prevented?**

A. Before taking a trip upon the cars be careful to have the bowels thoroughly evacuated. Make the diet consist of cereals and fruits, avoiding fats and wholly discarding meats. While riding on the cars keep the head in a

horizontal position. Do not attempt to read. Do not look out of the car windows. If possible, lie down and keep the eyes closed.

Cramp in Legs

Q. **What is the cause of cramping of the leg muscles?**

A. Cramping of the muscles of the legs is a frequent neurasthenic symptom. A very painful form sometimes occurs in elderly people as a result of hardening of the arteries of the legs. A cramping muscle can generally be relieved by firm pressure made by grasping the limb with the hands.

Relieving Leg Cramps at Night

Q. **What will relieve cramps in the legs, occuring at night in bed?**

A. A hot leg bath just before retiring, to be followed by a heating compress to be worn during the night, will afford relief. For the heating compress, a cotton stocking wrung quite dry out of cold water, and worn with a woolen stocking over it will answer the purpose; or a towel wrung dry out of very cold water, applied to the leg and covered with mackintosh and flannel.

Creaking Joints

Q. **What are the probable causes of cracking of the joints of the feet, legs, and wrist?**

A. Creaking of the knee joints is usually due to arthritis.

Diabetes

Q. **Is diabetes curable?**

A. In the majority of cases the disease is not curable in the strict sense of the word, but in nearly all cases the sugar may be made to disappear from the urine and the patient may be made able to live a comfortable and useful life for many years.

Cause of Diabetes

Q. **What is the cause of diabetes?**

A. It is now generally believed that diabetes is in most cases caused by a disease of the pancreas. Cane sugar and meat-eating are regarded as causes.

Dry Mouth

Q. **What is the cause of dryness of mouth and tongue at night?**

A. The cause may be sleeping with the mouth open or a feverish condition. Mouth breathing is almost always due to nasal obstruction. If due to fever at night, there is perhaps ground for suspicion that some chronic disease, as tuberculosis of the lungs, may be getting a foothold.

White Patches in Mouth

Q. **What is the cause and remedy of small white sores on inside of the mouth?**

A. The condition described is probably aphthæ. In children the mouth should always be washed out with a clean wet cloth immediately after feeding, for food remnants left in the mouth form the best possible soil for the production of the disease. An acid state of

the stomach and a feeble condition of the system favor the production of this condition. The use of sour fruits and raw tomatoes is sometimes the exciting factor. Rinse the mouth often with boracic acid solution or peroxide of hydrogen in water.

Foul Breath

Q. **What is the cause of a foul breath?**

A. There are many minor causes, such as decaying teeth, chronic nasal catarrh, and diseased tonsils, but the principal cause is constipation. The poisons absorbed from the colon are discharged through the lungs giving a fecal odor to the breath. The remedy is to adopt an antitoxic diet and to train the bowels to move three times a day.

Enlarged Finger Joints

Q. **What causes enlarged finger joints?**

A. The condition is probably rheumatic in character, and is often connected with dilatation of the stomach. It is practically incurable, though further progress of the disease may often be arrested by careful regulation of the diet and by proper treatment. The fingers should be soaked in hot water for ten minutes twice daily, and afterward the hands should be dipped in cold water for a few seconds, then rubbed and flexed. If quite painful, the rubbing should be gentle, simply passing the hands over the joints with moderate pressure. A moist bandage consisting of two or three thicknesses of cheese cloth wet in cold water, and well wrung, should be wrapped around the joints, covered with

flannel and mackintosh, to be retained during the night.

Massage of the joints with olive or cocoanut oil or white vaseline is excellent.

Numb Fingers

Q. **What causes numbness and tingling in the finger ends when they become cold? What is a good remedy?**

A. A disturbed circulation. Bathing the hands alternately in hot and cold water morning and night for ten or fifteen minutes, and massage, are useful measures. The real cause of this condition in most cases is intestinal autointoxication, which is a common result of chronic constipation. The condition of the fingers should receive attention promptly, since it may easily develop into a most serious condition known as "dead finger."

Exposure of the parts to the rays of the arc light or the quart light is an excellent means of stimulating the tissues and restoring a normal condition.

Exposure to the sun's rays is an equally efficient method. Care must be taken to protect the fingers from the cold.

Foreign Bodies Swallowed

Q. **Do foreign bodies do much harm in the stomach and may they be safely removed?**

A. Small coins, buttons, and other round objects, generally create no very great disturbance if they reach the stomach, as they usually do. Much unnecessary alarm is often felt when articles of this kind have been swallowed.

Even pins and needles are generally successfully passed through the intestine if they reach the stomach. The intestine shows marvelous intelligence in dealing with these sharp objects. Professor Roger has shown by experiments upon animals that when a pin is placed in the intestine with the point downward and sticking into the intestinal wall, the intestine promptly turns the pin over, giving the head a down-stream direction, thus preventing penetration of the intestine. When any sharp or angular object has been swallowed which may possibly injure the stomach or intestines, the danger of injury may be frequently lessened by giving large quantities of potatoes and other bulky vegetables, so as to distend the stomach and bowels and thus give plenty of room for the passage of the foreign body.

When the substance swallowed is of a metallic character, its location may easily be determined by means of the x-ray. Frequently such bodies are discharged from the bowels without their escape being noticed. In such cases the x-ray examination will render great service by removing cause for further anxiety.

Fever

Q. **What is the cause of fever?**

A. Fever may result from an increase of heat production or deficient heat elimination. The principal cause of the rise of temperature in fever has been shown to be due to diminished elimination of heat. The sweat glands become paralyzed, the skin is dry, so that little evaporation takes place from the surface.

Diet in Fever

Q. **How should fever patients be fed?**

A. It is highly important that fever patients should receive a proper amount of food and food of the right sort. Physiologic experiments have shown that during fever, especially when the temperature is high, the muscles, glands and blood are rapidly destroyed. This is the reason for the great weakness as well as emaciation of the fever patient whose temperature has run very high for some days. From careful investigation May reached the conclusion that the destruction of the tissues in fever is due to the lack of carbohydrates. More recently conducted experiments show that by feeding an abundance of carbohydrates the wasting of the muscles and the extraordinary weakening of the body which frequently occurs may be prevented. This is a matter of very great importance. It is also interesting to note that these scientific experiments confirm the practical observations made long ago by physicians that the best diet for fever patients consists of farinaceous preparations, fruits and fruit juices. Niemeyer, the eminent German physician, fed his fever patients on fruit soup, a very popular dish in Germany. Hippocrates, the noted physician of ancient Greece, recommended for fever patients a thin gruel prepared from barley—"ptisan."

The starvation plan of treating fever patients is known to be positively dangerous and should be abandoned. The diet should consist of fruits, fruit juices and cereal preparations. The juice of fresh or dried fruits is greatly to be preferred to cooked fruits for the reason that cooking de-

stroys the precious vitamines of which the fever patient stands greatly in need. Von Hoesslin demonstrated long ago that fever patients should be given quite a liberal supply of food of the right sort to prevent the great weakening which is certain to occur from the combined influence of the fever processes and starvation.

Gout

Q. **What is the best diet for gout?**

A. Gout is due to an accumulation of uric acid in the body. The diet best adapted for persons suffering from gout is such a diet as will enable them to eliminate uric acid from the system. Since uric acid is a result of meat eating, meat should, of course, be discarded.

Doctor Hinhede, an eminent Scandinavian physician who has given much attention to the study of diet, and who has, for many years, advocated a low-protein and non-flesh dietary, has recently published the results of extended experiments with various exclusive diets, especially in relation to uric acid, in which he found that when the diet consisted of potatoes only the urine was but slightly acid and contained no uric acid. He finally discovered that the urine from a potato diet was capable of dissolving from one-half dram to a dram of uric acid daily. This was found to be true, also, when strawberries or milk, or both, were taken with the potatoes. A diet consisting largely of apples or tomatoes produced similar results.

Soreness in the Side

Q. **What is the cause of soreness in the right side of the body near the stomach?**

A. The symptom may be due to any of several things. Pain near the stomach under the right rib may be due to ulcer of the stomach, ulcer of the duodenum, disease of the pancreas, disease of the gall-bladder, gallstones, or other less common affections.

It is entirely possible that the soreness may be due to a diseased kidney; or the appendix or the colon may be diseased. There are many other possibilities. You should be examined by a thoroughly competent surgeon as soon as possible. An X-ray examination after a bismuth meal would doubtless throw great light on your case.

Bowel Trouble in Summer

Q. **Why are bowel troubles so frequent in summer time?**

A. "Bowel troubles" are the prevalent disorders of summer, and the mortality lists are lengthened by fatalities due to this class of maladies. Old and young suffer, but infants most.

Recent experiments and observations by European physicians show that the chief cause of these maladies is to be found in the increase during the warm months of the particular class of germs which give rise to putrefaction.

Milk, meat, and bad water are the chief sources of infection. Milk may be boiled, and meat should be discarded, better forever, but certainly during the hot months, when it is always swarming with the germs which cause de-

cay. Water should be boiled unless known to be pure. Water from dug wells or from lakes, streams and any sources except springs or artesian wells, is certain to contain harmful germs, parasites, and various impurities. Such water is always unfit for use without boiling.

A precaution which will almost certainly prevent these summer bowel troubles is the careful disinfection of fruits and all other fresh foods, such as lettuce, celery, radishes and cabbage. These foods are often soiled with sewage or soil used as fertilizer and hence are highly infected. They often introduce animal parasites into the intestine. It is easy to render these foods entirely wholesome as follows: Wash thoroughly in clean water then soak for five minutes in a solution of peroxide of hydrogen one part to twenty of water. After soaking in the peroxide solution rinse well. Fresh fruit and raw vegetables from the market should never be eaten without this preparation. Of course vegetables grown in one's own garden may be known to be safe.

Fruit, fruit juice, cereals, and fresh vegetables should be the chief dietary during the summer months. Keep the bowels moving freely by a laxative diet, and keep the general health up by free water drinking, the daily cold bath, and the out-of-door life. This advice can not be too often reiterated.

Hemorrhage of the Bowels

Q. **Is there any connection between hemorrhage and constipation?**

A. Hemorrhage from the bowels is most frequently due to hemorrhoids, in which case con-

stipation may be the direct cause of the hemorrhage. Hemorrhage also sometimes results from ulcer, due to colitis. Ulcer of the stomach or of the duodenum not infrequently gives rise to bloody stools.

Pain in the Bowels

Q. **Can pain in the bowels be relieved by heat applications?**

A. Fomentations are very useful when the pain in the bowels or abdominal region is due to local inflammation of some sort, as peritonitis, inflammation of the small or large intestine, or other abdominal or pelvic viscera. The applications should not be continued more than fifteen or twenty minutes, when a cool compress should be applied for an hour or two, after which the fomentation may be again renewed.

Goitre

Q. **What is the cause of goitre?**

A. The cause of goitre is still somewhat uncertain, but it is believed by many authorities who have studied the subject to be due to a parasite that is found in water.

In certain regions goitre is common while in others not far away people do not have it at all.

In Switzerland, people in localities where water is used from certain wells are subject to goitre; others who get water from a different stratum do not suffer from the disease.

If the water from some of these "goitre wells," as they are called, has some fish put into it the fish are attacked by goitre. Enormous goitres swell up behind their gills.

Goitres are likely to be endemic. If cases appear in certain localities, an investigation of the water supply ought to be made. A tank should be arranged, filled with the water supposed to contain the parasite, and some trout known to be free from goitre, which can be obtained from the United States Government fisheries, should be put into it.

The fish should be kept in the tank, using water from the same source of supply for six months or a year. If the fish get goitre, the people who use the supply are likely to contract it.

Polinosis (Hay Fever)

Q. **What is polinosis and how may it be cured or prevented?**

A. Polinosis, commonly known as hay fever, is produced by the inhalation of the pollen of timothy, weeds, certain trees, and a very great variety of plants. Possibly the pollen of all plants is capable of causing hay fever.

The characteristic symptoms are itching and weeping of the eyes, sneezing, water discharge from the nose, embarrassed breathing, and itching sensation of the palate and face. In severe attacks there is also a wheezing respiration, sometimes coughing.

All people are not subject to hay fever. In order that a person should have an attack of hay fever, there must first be a penetration of the tissues by pollen. This penetration may occur through an abrased skin surface, or may possibly be due to penetration of an abnormally thin skin or mucous membrane by the pollen.

It is in this way that a person becomes sensi-

tized. Some people are sensitized to one species of pollen, others to another. A person may be sensitized to several species. Simple tests are now known by which it is possible to ascertain the particular plant to which a person is sensitized. Tests are made in various ways. The simplest way is to make an abrasion of the surface as in vaccination and then rub on some of the pollen of the suspected plant. A number of tests are sometimes required to find the particular plant to which the individual is susceptible.

Extensive experimentation has also developed a method of immunizing a person against hay fever. After ascertaining the plant or plants to which a person is sensitized the person may be rendered immune to this particular plant by injections of graduated doses of extract of the pollen of those plants. The extract is introduced in gradually increasing doses during a period of several weeks or months prior to the flowering time of the plants and by this means the person will gradually lose his susceptibility. Of course, it is necessary for a person to be immunized against all of the different species of plants to which he has been sensitized. This method is being greatly perfected and already a considerable number of persons have been relieved of their susceptibility to hay fever by its use,

Susceptibility to Hay Fever

Q. **Is everybody susceptible to hay fever?**

A. No; only about one per cent of the population is susceptible to the disease. The susceptibility of hay fever subjects varies widely, not only in their reaction to the different plant pol-

lens that cause the disease, but also in the degree of the reaction. The majority of subjects in the eastern and southern States are sensitive to the pollen of the ragweeds and are therefore victims of the spring type of hay fever. A smaller number are susceptible to the effects of grass pollen, and have the autumnal type of the disease. Others are sensitive to both (spring-autumn hay fever). About eight per cent are sensitive not only to ragweed and grass pollens, but also to the pollens of various other plants, including certain trees, and hence suffer from attacks during a greater part of the year (perennial form). Some patients suffer only when the specific pollen is especially abundant in the air, others during the whole pollinating season of the plant.

According to Professor H. M. Hall, of the University of California, "the prevalent assumption that the tree pollens play only a minor rôle, if any, as casative factors in hay fever must now be abandoned, since one species alone has been demonstrated to be the cause of hundreds if not indeed thousands of cases in California." The tree in question is the California black walnut much used as a shade tree in certain towns of the Sacramento valley. Hay fever of the spring type is very prevalent in this region and coincides in time of occurrence with the sifting down of abundant pollen from the black walnut. The treatment of numerous hay-fever subjects to render them immune to hay fever has been undertaken, serums prepared from black walnut pollen being the ones most used. Professor Hall suggests investigation of the relation of black walnut to hay fever in the eastern states.

Prevention of Hay Fever

Q. **Is there any way in which a locality can be freed from hay fever?**

A. This is a new question in public health, but one that promises fair to be answered satisfactorily.

Through the efforts of the American Hay Fever Prevention Association, the city of New Orleans has recently adopted a hay fever ordinance, which provides that the tenant or owner of any premises shall not permit weeds or grass over two feet in height to grow or stand on such premises, or permit weeds or grass over one foot in height to grow or stand on the sidewalk abutting such premises. In commenting on this ordinance, which has been hailed as the first of its kind to be adopted in America, the New York City Department of Health calls attention to Section 221 of the New York Sanitary Code, which was adopted a year ago and reads as follows: "Growth of poison ivy and rag weed prohibited. No person owning, occupying, or having charge of any lot or premises in the City of New York shall cause, suffer, or allow poison ivy, rag weed, or other poisonous weed to grow therein or thereon in such manner that any part of such ivy, rag weed, or other poisonous weed shall extend upon, overhang, or border upon any public place, or allow the seed pollen or other poisonous particles or emanations therefrom to be carried through the air into any public place."

Hodgkin's Disease

Q. **What are the nature and symptoms of Hodgkin's disease, and is the disease curable?**

A. The cause of this disease has not yet been satisfactorily determined.

This disease has generally been regarded as incurable. Recently however, the application of the x-ray, by the so-called intensive method has secured results which give some promise of success. A person suffering from this disease should place himself under the care of a competent physician and an up-to-date x-ray specialist.

Hiccough

Q. **What is the cause of hiccough and how may it be relieved?**

A. Hiccough is produced by a sudden spasm of the diaphragm. It may be excited by eating too much, thus causing indigestion and irritation of the stomach, drinking a large quantity of cold water, or by long continued or immoderate laughter. It also occurs, sometimes, in the last stages of wasting diseases, when it is regarded as a very grave symptom, indicating approaching dissolution.

Treatment: Hiccough can generally be stopped by taking a very small sip of very cold water or swallowing a small piece of ice. It may also generally be checked by holding the breath a long time, so as to interrupt the paroxysm, which occurs at regular intervals. When it is very obstinate, and is evidently the result of indigestion, the stomach should be washed out with a stomach tube.

Hookworm

Q. **What is the nature of hookworm?**

A. This disease is one of the most prevalent, most harmful and most certainly curable of all parasitic diseases. It is found throughout the world. More than half the population of the globe are exposed to this malady. The disease was known to the ancient Egyptians, although its cause was not understood. It is less than a hundred years since the discovery of the hookworm by an Italian physician. It was first discovered in this country in Porto Rico in 1899. Three years later it was discovered in the southern states. It is believed that the disease was brought to this country through the slave trade. In some parts of the South ninety per cent of the whole population are found affected by this disease. It is more frequent in country districts than in cities. It is especially prevalent among the so-called mountain whites of the South.

The Cause of Typhus Fever

Q. **What is the cause of typhus fever?**

A. The cause of this disease, until recently a profound mystery, has been now clearly shown to be a minute micro-organism which is communicated to human beings by the body louse. The fact that the louse is an active carrier of the infection was first shown by Plotz. Recent work done in Mexico by Olitsky and others confirm the work of Plotz, and it may now be regarded as definitely proven that typhus fever is caused by the bite of infected body lice. A vaccine has been produced by the use of which a person may

be rendered immune to this disease. Of more than eight thousand persons vaccinated, and who were thoroughly exposed to the disease, only six contracted the disease. It has been observed that typhus fever is much less severe and fatal in certain races, particularly Jews and Arabs. It is a curious fact that typhus fever is chiefly confined to the colder regions of the earth. This is because the body louse is more active in cold latitudes, being rendered lethargic by heat.

Sprue Due to a Fungus Infection

Q. **What is the cause of sprue?**

A. A study of sprue by Brown confirms the view that this disease is due to infection by a fungus, monilia, allied to the fungus which produces thrush. His observations also show that the pancreatic secretion is lacking in this disease and the patients are benefited by the use of pancreatic extracts.

Resuscitation After Electric Shock

Q. **What is the best means of reviving a person who has been rendered unconscious by electric shock?**

A. It has long been known that the same methods which have been found useful after drowning or asphyxia from smoke are also serviceable and often successful in cases of electric shock. Artificial respiration by any of the several methods elsewhere described should be applied at the earliest possible moment. The tongue should be pulled forward by seizing with a handkerchief or a bit of cloth, and should be held forward to keep the throat clear. If necessary

the jaws are propped open by a thick fold of cloth or paper placed between the teeth.

The best means of applying artificial respiration is the pulmotor. This instrument should always be at hand where there is danger of injury from electric shock. The apparatus is automatic when once set in operation and is most efficient. It fills the lungs with oxygen and then empties the lungs and fills them again thus continuing until the supply of compressed oxygen is gone. The lung motor is a pump which may be used in a similar manner, but is somewhat less efficient.

Another measure which has recently been used with success is violent slapping of the feet with a stick without removing the shoes. Lifting the legs and trunk high as possible then dropping upon the ground, the head being left upon the ground, is another method which is said to be useful. It is well to be prepared to practice all these methods in succession or more or less simultaneously as none of them are infallible.

Suitable applications of water are also useful. Hot fomentations to the spine alternating every half minute with ice rubbing, may arouse the paralyzed centers of the spinal cord and thus aid in restoring normal action of the heart and lungs. Cold applications to the chest are also very useful. They should be short and accompanied with slapping of the chest.

Enlarged Lymph Glands

Q. **What is the cause of enlarged lymph glands?**

A. The cause of enlarged lymphatic glands is usually tuberculosis. In the majority of cases recovery takes place spontaneously. This is because the glands are good fighters in the first place. It is their business to resist germs. They are policemen placed about the citadel of life for the purpose of protecting it. Suppose there were a row of police—a hundred in line—standing in front of a house, and that burglars were compelled to fight every one of those policemen before they could get into the house; it would stand a very good chance of remaining unmolested. In just this way, the lymphatic glands are policemen. If a sliver lodges in the finger, and a nest of germs attacks the body, then the lymphatic glands in the neighborhood come to the rescue and become enlarged. The nearer we approach the center of the body, the greater number of glands we find to oppose the germs. Germs must fight their way through a long procession of glands before they can obtain a foothold in the interior of the body.

But when germs get into the glands themselves, they become inflamed and greatly crippled. If they become seriously affected, they should be removed; yet people are often in too great a hurry to have the glands removed. They are the natural barriers of the body and when they are broken down there is nothing to prevent the germs from establishing themselves in the body.

Malarial Chills

Q. **Can malarial chills be cured without medicine?**

A. Nearly four hundred years ago, Don Alexis, of Piedmont, Italy, was treating cases of malarial fever successfully by means of sweating baths applied just before the beginning of a chill. The patients were first rubbed with hot linen cloths, then warmly wrapped and made to perspire. The same method, in one form or another, is still in use by the laity in various parts of the world.

The writer was cured of a very severe attack of intermittent fever nearly fifty years ago by a corn sweat, prescribed by an old lady who had used it successfully in a large number of cases. The remedy often succeeds at the very first application, though sometimes three or more applications were needed, as observed by Don Alexis.

Among the laity of Germany, a method employed by Priessnitz, and probably in use long before his time, consisted in the cold douche. On the first approach of a chill, several pailfuls of cold water were poured over the patient. He was then vigorously rubbed, put to bed, wrapped with woolen blankets, and made to perspire vigorously. This method answers very well in persons with strong constitutions. A combination of the two methods is most effective.

It must be added that while the cure of malarial infection is often possible without the use of quinine, in most cases it is well to use quinine in connection with the methods outlined above. By this means the treatment succeeds more

quickly. The dose of quinine required is small, usually not more than five grains repeated at proper intervals until fifteen or twenty grains have been taken.

Mouth-Breathing

Q. **How may mouth-breathing be corrected?**

A. The nose should have attention. There is probably more or less obstruction of one or both nostrils. If the habit still continues, the mouth should be closed by some suitable appliance during sleep. A thin strip of celluloid fitted in between the lips and the teeth answers the purpose very well. The lips may be closed by strips of adhesive plaster.

Mouth-breathing during sleep is evidence of the presence of adenoids. A nose and throat specialist should be consulted and the adenoids should be removed, the earlier the better, as mouth-breathing gives rise to malformations of the upper jaw, and also of the nasal and other facial bones, and defects of speech, while the diseased condition to which the adenoids is due may extend into the Eustachian tubes, and may even affect the hearing. Mental impairment also has been traced to adenoids and other conditions which give rise to mouth-breathing.

The Pulmotor

Q. **What is the pulmotor?**

A. The most successful method of applying artificial respiration is by means of the pulmotor, a new invention by means of which oxygen is forced into the lungs, making the

chest act as in ordinary respiration. This method has been successful in reviving persons who have apparently been dead for some minutes. It should always be used in cases of suspended respiration from whatever cause. It has been especially successful in cases of apparent death from electrical shock.

In choking, strangling, hanging, and whenever respiration is suspended by any cause whatever, the methods of artificial respiration described should be employed. In cases of suspended respiration from the use of chloroform or any anesthetic, the head should be placed lower than other parts of the body. In case of heart failure, sharp percussion over the heart should be tried and repeated many times. Rhythmical traction of the tongue is a method for restoring respiration, which should never be neglected.

Pneumonia

Q. **Is there any drug which will cure pneumonia?**

A. It is now known that pneumonia is an infectious disease and it runs a regular course like measles, small pox and other contagious diseases. It is also probably infectious like these diseases. No intelligent physician at the present time will administer drugs to a pneumonia patient with the expectation that the pneumonia will be cured thereby; in fact there is no treatment which will cure pneumonia, but there are many simple measures of treatment which are of great service in the disease. Among these are the cold compress or ice bag to the chest during the early

stages of the disease which is a most efficient means of relieving cough and pain and lessening the intensity of the disease. The cold application should be removed for five minutes about once in twenty minutes. When there is much pain a short hot fomentation (see index) may be applied for two or three hours. A hot blanket pack (see index) from the hip down is an excellent means of relieving pulmonary congestion. The patient should take a glass of water every hour. The bowels should be opened by means of enemas administered two or three times a day. The patient is greatly benefited by being kept in the open air. In one of the largest children's hospitals in New York very young children who are suffering from pneumonia are kept out of doors constantly, even during the very coldest weather. They are of course well wrapped to prevent chilling. The children are permitted to breathe very cold air with the greatest possible benefit. Many apparently hopeless cases have thus been saved. A prolonged very hot bath taken in the beginning of an attack of pneumonia may lessen the intensity of the disease and shorten its course.

Fomentations exercise a favorable influence upon the cough. Sipping hot water is also an excellent measure for relieving cough.

How to Prevent Pneumonia

Q. **Is pneumonia catching? Can it be prevented or avoided?**

A. Recent investigations have shown that there are four types of pneumonia, varying in

virulence and fatality. One form of the disease is produced by germs which are found in the mouths of people who live in cities. This form of the disease, fortunately, produces a very mild type of the disease and is rarely fatal.

The other types of pneumonia are caught by infection from other persons just as is typhoid fever, small pox and measles.

The germs of pneumonia are sent into the air by coughing, sneezing and speaking. In this way the infection is scattered. Persons who have apparently recovered from pneumonia often carry the germs in the nasal secretions and sputum for weeks, possibly longer, and thus become carriers of the disease.

Two things are necessary to produce pneumonia, a pneumonia germ and a susceptible patient. A person whose resistance is sufficiently high may meet any number of pneumonia germs without danger. The germs are received, but they are unable to obtain a foothold and develop the characteristic disease.

Fresh air in abundance day and night, care in diet, avoidance of poison habits, alcohol, tobacco, tea, coffee, etc., daily cold bathing, avoidance of contact with persons suffering from pneumonia, grip or hard colds, these are the principal means of increasing resistance and combating the disease.

Pellagra and Meat Diet

Q. **Is a meat diet necessary in pellagra?**

A. In the investigation of the cause of pellagra made by the United States Public Health Service the conclusion was reached that the real cause of pellagra was not to be found

in moldy corn or any form of infection but in a defective dietary. Meat was among the articles recommended as beneficial in pellagra cases. Meat is not necessary to prevent pellagra. The conviction is gaining ground among physicians that the cause of pellagra is a lack of vitamines in the food. It is true that vitamines are present in meat but the amount of vitamines present in flesh foods is not greater than that found in most vegetable foods; indeed, vitamines are much more plentiful in certain vegetables than in meats; this is particularly true of peas and beans. In speaking upon this subject Doctor Goldberger admitted that the use of meat was not necessary provided eggs, milk, peas or beans were supplied. Observations made in the treatment of beri-beri and allied diseases showed that the addition of beans to the diet was a much more efficient method in curing and preventing beri-beri than the use of meat.

Enlargement of the Prostate Gland

Q. **What is the cause of this condition and how may it be remedied?**

A. Men only are subject to this disease. The prostate gland in men is a structure analogous to the womb or uterus in women. Chronic enlargement of the prostate gland is a condition closely akin to the development of fibroid tumors of the uterus. A temporary enlargement of the prostate gland may be due to inflammation. In such cases increased activity of the bowels, the avoidance of irritating condiments and flesh foods and copious water drinking are measures which should not be neglected. A very hot sitz

bath or a hot hip and leg pack are the best means of affording relief from pain. These applications may be repeated several times a day. After the pain subsides colder baths may be used. A prolonged sitz bath at 80° to 70° F. continued for ten or fifteen minutes is the best means of combating congestion which follows acute inflammation. Chronic enlargement of the prostate gland is a very serious condition quite common in men past middle life. It is, in fact one of the gravest conditions to which men in advanced years are subject, and is the cause of an enormous amount of suffering and not a few deaths. Nearly all of this suffering and mortality might be saved if attention were given in time. As the gland becomes enlarged it interferes more and more with the discharge of urine from the bladder. After a time a considerable quantity of urine is retained, and the so-called residual urine of the bladder is never emptied. Occasionally the bladder becomes over-distended and there is continued leaking or drippling of urine, giving the patient the impression that he is passing an excessive quantity of urine. In a case of this sort encountered by the writer the bladder was found to contain more than two quarts of very foul smelling urine as a result of the retention. The urine readily undergoes decomposition and inflammation of the bladder is set up. After a time the inflammation extends to the kidneys and when both of the kidneys become involved death is likely to follow as a result of uremic coma. In the early stages simple enlargement of the prostate may generally be relieved by the prolonged cold sitz bath, ad-

ministered daily for several weeks or months. The temperature of the bath should be 80° at first and gradually reduced to 70° or even 60° F. The duration of the bath should be ten to fifteen minutes. When the prostate becomes enlarged to such a degree that mechanical obstruction occurs and the bladder cannot empty itself of its contents a catheter must be used several times daily for temporary relief. As soon as the usually present infection of the bladder can be relieved a surgical operation for the removal of the obstruction should be performed. This operation was formerly attended by great danger to life but improved methods which have come into vogue within the last few years render the operation practically safe, especially when it can be performed before the kidneys have become seriously involved. The greatest danger connected with the operation results from the use of ether or chloroform. Fortunately this danger may now be avoided thanks to the improved methods of administering laughing gas, which may be safely employed.

Quinine

Q. **Is there such a thing as quinine fever?**

A. Half a century ago, the pioneer settlers of Michigan, Indiana and other states, which then constituted the West, suffered greatly from malarial infection, and sometimes not finding relief from quinine, successfully adopted a plan of wearing out the disease. These veterans in the warfare with one of the most terrible parasites which has ever afflicted the human race, learned by experience that paroxysms of chill

and fever sometimes followed the use of quinine, a fact which gave rise to the phrase, then current, "quinine chills." Modern studies of the effects of quinine upon the human organism have explained these puzzling facts. It has long been known that quinine is a protoplasmic poison. It weakens the parasites, but at the same time weakens the white blood cells. This has been shown by numerous observers, among others Binz, Baxter, Martin, Jerusalimsky, and Cohnheim. Hare showed that one part of quinine in twenty thousand parts of blood arrests amœboid movements and hence renders the leucocyte incapable of capturing the malarial plasmodium. Professors Koch, Rivet and others have reported cases in which malarial paroxysm has occurred as a result of the administration of quinine and on examination of the blood showed the presence of parasites. In a case reported by the London *Lancet* some years ago (Sept. 22, 1906), doses of quinine ranging from three-fourths of a grain to twenty grains were on four different occasions within two weeks followed by severe malarial paroxysms. Potter calls attention to this fact in his work on "Materia Medica," stating that malarial paroxysms have been produced by quinine in many well authenticated instances, noting the fact that quinine never produced such effects except in malarial subjects.

Jacobson finds the explanation of these interteresting observations in the fact that quinine paralyzes the white cells of the blood to such an extent that they are not able to recover themselves before the parasites, which hide in the

tissues when the quinine is present, return to the attack after its elimination. Being thus left defenseless, the body is at the mercy of the parasites. Thus, quinine instead of affecting a cure actually produces an aggravation of the disease by lessening the natural defenses. It cannot be denied that quinine renders valuable service in the treatment of malarial fever, but it is important that the possible evil effects which arise from its use should also be recognized and especially that the important fact should be borne in mind that the real cure of malarial fever, whether with or without the use of quinine, is accomplished by the natural powers of the body, especially by the leucocytes whereby the plasmodium is captured and destroyed.

Ague Chill after Hot Bath

Q. **Why is a hot bath often followed by ague chill?**

A. In persons suffering from chronic malarial infection the parasites which give rise to the disease sometimes have been absent from the blood, where they are always present during an acute attack. In such cases the parasites are believed to be hiding in the spleen and other vascular organs. The effect of a hot bath is to bring the parasites out into the circulation. the result of which is the occurrence of a chill. This fact renders hot baths valuable as an aid in combating malarial fever. In connection with the hot baths, small doses of quinine may succeed in destroying the parasites, when without the hot baths large doses would prove inefficient.

Muscular Electricity

Q. **Is it true that electricity is generated in the body?**

A. Experiments upon both human beings and animals have clearly demonstrated that the human body is a real electrical battery, generating appreciable quantities of electricity by every vital act. Every muscular contraction generates a current of electricity, the exact quantity and quality of which can be determined by the proper instruments. There is no special electrical apparatus in the human body, as in certain fishes and other curious animals which produce this subtle agent in prodigious quantities, but the whole body develops it. Every breath we draw in, every heart beat, every wink of the eye, even every thought, generates the same element that darts destruction from the thunder cloud, and flashes intelligence around the world.

Seasickness

Q. **What is the cause of seasickness and how may it be avoided?**

A. It is now believed that seasickness is due to the excessive stimulation of the pneumogastric nerve, causing spasmodic contraction of the stomach and abdominal muscles. The irritation is due to the sudden and repeated disturbance of equilibrium due to the movements of the ship in one who is not accustomed to such movements. Young infants are never seasick, probably for the reason that they are accustomed to frequent changes of the position of the body.

A sea-sick person should remain horizontal,

with ice bag to back of neck, the eyes closed and a firm bandage applied over the stomach and abdomen. A sand bag might serve the same purpose. Lying in a tub of water is also found beneficial. Some large ocean vessels are now supplied with swimming tanks in which one may enjoy complete immunity from seasickness.

Sty

Q. **What causes styes?**

A. Eye strain causing congestion of the eye. Consult an oculist.

Violet Rays

Q. **How can one obtain the benefit of the violet rays without great expense?**

A. By exposure to the sun's rays. If the rays of the sun are so hot as to cause unpleasant effects, this difficulty can be overcome by allowing the rays to pass through colored glass.

A better plan, however, is to protect the head by a shield of some sort, and then to expose the rest of the body in sections, making the time of exposure a little longer each day. "Tanning" the whole skin of the body is very beneficial.

Snake Bite

Q. **What is the best remedy for the bite of a rattle snake and is whiskey beneficial?**

A. When a person has been bitten by a rattle snake or any other venomous serpent, the following measures should be adopted. 1. Place around the limb, a short distance above the wound, a cord, tying it as tightly as possible. A whip-cord, shoe-string, neck-tie, strap, or anything which can be made to answer the

purpose of a ligature, may be used. It should be sufficiently tight to cut off the circulation. This may be accomplished by placing a small stick beneath the cord and twisting it tight about the limb. 2. If possible, cut out the bitten part, being sure to include all of the poisoned tissue. 3 If there is no sore, ulcer, or abrasion in the mouth, it will be safe and proper to next proceed to suck the wound, as the poison will do no harm if not received into the circulation. Freely incise the bitten place and rub in crystals of permanganate of potash or apply a solution of chloride of lime (teaspoonful to the pint). Surround the patient with blankets and hot bottles. Wash stomach every half hour with stomach tube until dangerous symptoms disappear. An anti-venom has been prepared which protects against cobra bite but is of very little value against other snake bites. Alcohol in the form of whiskey or brandy has been very frequently shown to be no antidote. The popular belief that alcoholic liquors are necessary in the treatment of snake bite has been abundantly shown to be without foundation. According to Wilson, one in twenty of the deaths from snake-bite in the United States are due to the large quantities of whiskey given. It should be recollected that many of those bitten are not poisoned, to which fact may be attributed the supposed efficacy of many remedies which have been recommended.

Hernia

Q. **Can rupture be cured without an operation?**

A. A truss applied very early in young persons, well fitted and worn constantly will sometimes effect a cure if the rupture is slight in extent. Other non-surgical methods are altogether unreliable and some are dangerous. An operation is safe, and in skilled hands nearly always succeeds.

Small Hernia Dangerous

Q. **Is a small rupture the size of a hickory nut likely to do any harm?**

A. Small ruptures are much more dangerous than large ones since they are more likely to produce obstruction. All ruptures are dangerous and when possible should be cured by a radical operation.

Typhoid Fever

Q. **Will water drinking cure typhoid fever?**

A. There are physicians who believe that a glass of water taken every hour is about the only treatment a typhoid fever patient needs.

Copious water drinking has been shown to be an efficient means of combating the pronounced toxemia of typhoid fever. Cushing and Clark reported (*American Journal of Medical Sciences*) most excellent results from this method. They made the patient drink four ounces of water every fifteen minutes when awake, and gave besides every two hours during the day and once or twice at night in alternation six ounces of milk and six ounces of albumin water. They found that the patients were

soon able to take from a gallon to a gallon and a half of water every twenty-four hours. They found great amelioration of all the toxic symptoms, the tongue and mouth remained clean and moist, headache was little troublesome, apathy, restlessness, delirium and other symptoms of toxemia were less pronounced, nausea seldom occurred, and the fever was easily controlled. Fifty-six cases were treated without a single death, although the epidemic prevailing in the neighborhood was of a severe type and the mortality large.

Typhoid Carrier

Q. **What is a typhoid carrier?**

A. It has been discovered in recent years that certain persons are microbe carriers.

When a person suffers from pneumonia, scarlet fever, diphtheria, or typhoid fever, recovery, if it takes place, is due to the development of immunity. That is, the tissues of the patient develop such a degree of tolerance for the infecting microbe that its presence is no longer capable of giving rise to serious symptoms. Typhoid, diphtheria or pneumonia patients do not recover because the bacteria which produce the disease have left the body, but because the body has acquired ability to successfully combat the invading bacteria or to render its poisons innocuous.

Numerous observations have been made that show in the case of typhoid fever the subjects of this disease continue to discharge daily from their intestines millions of typhoid fever germs for three months or more. A recent epidemic

of typhoid in New York in which the infection was conveyed through milk was traced to infection by a typhoid carrier who had suffered from typhoid fever in the west some forty-six years previously.

A most remarkable typhoid carrier is Mary Mallon, the famous "Typhoid Mary," a cook, who has carried typhoid germs about with her for more than fifty years, although it could not be learned that she herself ever suffered from an attack of the disease. The probability is that she suffered from an attack of the disease in so light a form that its real nature was not discovered; nevertheless she was the cause of typhoid fever outbreaks in eight families in which she worked at different times. Although confined for a time, "Typhoid Mary" is now free and may be employed by some family as a cook.

Careful bacteriologic investigations have shown that in every community two or three persons out of every hundred carry about with them continually diphtheria germs, while two or three in every thousand persons are typhoid carriers. This important fact explains the occasional occurrence of outbreaks of typhoid fever, diphtheria and other diseases that cannot be traced to direct infection from persons suffering from an acute attack of the same maladies.

Precautions Against Typhoid

Q. **What precautions are necessary in eating in a house which contains typhoid fever?**

A. Everything eaten in such a house should be thoroughly sterilized by boiling or exposure to the heat of a hot oven before eating. There

is still more danger if there is any communication, either direct or indirect, with the fever patient. It should also be remembered that flies are a common means of conveying typhoid fever infection. Hence precautions should be taken to exclude flies from the fever patient and also from contact with all eatables.

Vaccination Against Typhoid Fever

Q. **Has the new method of vaccination against typhoid fever proved successful?**

A. The method of vaccination against typhoid fever perfected by Dr. Wright of London, has now been very extensively used in the army of the United States and other countries and is found to be highly successful. The method is harmless and the protection is said to last for at least three years.

Diphtheria Carriers

Q. **Is there any means by which persons who have had diphtheria and still harbor the germs in their throats may be cured so that they will not be a menace to those with whom they associate?**

A. Yes; a simple remedy has recently been suggested. Lactic acid forming germs are antagonistic to all forms of disease producing germs outside the body as well as in the body.

Moffit suggests the use of fresh buttermilk as a gargle in patients who have had diphtheria but in whose throats cultures of the diphtheria bacillus were present after all other manifestations of the disease had disappeared. The plain buttermilk was used five or six times a day and from his experience with nine cases, Moffit be-

lieved that the diphtheria organisms will be displaced entirely within three days, while pure cultures of the lactic acid bacillus will be found on the swab.

This is in harmony with a suggestion recently made to use cultures of the bacillus bulgaricus for the same purpose. Swabbing the throat (or gargling) two or three times daily with a good liquid culture of this organism is sufficient to render the throat free from dangerous organisms and to facilitate the releasing of the patient from quarantine. It was also suggested that this same procedure might be equally useful in diphtheria.

Varicocele

Q. **Can varicocele be cured by natural methods?**

A. Varicocele is curable by a slight operation. Radical relief cannot be obtained in any other way.

Water Drinking in Dropsy

Q. **If a person is dropsical, or if water collects in any part of the body, should he refrain from drinking water or any kind of liquids?**

A. It is rarely necessary for one to refrain from drinking water in dropsy. The dropsy is not diminished by lessening the amount of water taken by the mouth.

Lithia Water

Q. **Do you recommend lithia water in case of inflammation of the bladder?**

A. Yes; lithia water is good, but not better than ordinary water. In general, water should be freely used in case of inflammation of the bladder for the purpose of diluting the urine. It is immaterial whether the water contains a little lithia or not. Ordinary lithia water contains such a small amount of lithia that at least a barrelful would be required for an ordinary dose of this drug. It is immaterial, however, whether the proportion of lithia is large or small, as it has been clearly shown by modern investigations that lithia has no value whatever as a remedy for uric acid conditions, or diseases of the kidneys and bladder.

Hard Water as a Source of Lime

Q. **Does the body appropriate for bones and teeth the lime or calcium carbonate from ordinary hard water?**

A. We know of no evidence that the mineral constituents of hard water can serve as food or nutriment to the body. In the foodstuffs the lime exists in an organized form in which it is prepared for assimilation. The lime found in hard water is an ordinary inorganic mineral compound. The best sources of lime are oatmeal, graham bread, bran, milk and vegetables, especially "greens." Potatoes, sugar, rice, fine flour bread, meats, butter, lard and other fats, contain practically no lime. Milk and bran are very rich in lime, also turnip "greens" and spinach. These same foods with the exception of

milk are rich in iron. Lime and iron are usually associated in foodstuffs.

The Treatment of Influenza

Q. **What medicine or other treatment should be given in influenza?**

A. There is no medicine known which will cure this disease, but there are some simple methods of treatment of very great value. It must be understood, however, that in every case a competent physician should be called early, and no treatment should be given without the physician's advice or consent.

The following measures have been found highly useful:—

At the beginning of the disease, a thorough evacuation of the bowels should be secured by an enema consisting of two or three pints of warm water. The enema should be repeated until the bowels are thoroughly emptied, and continued twice a day during the disease.

Water or fruit juice should be taken daily to the amount of three or four quarts, so as to promote elimination through the skin and kidneys. A glassful of water or a little fruit juice every half hour, when the patient is awake, is a good rule to follow. Fruit juices may be used freely to a great advantage, and gruels of oatmeal, rice, and other cereals. Bran should be mixed with the gruel so as to promote bowel activity, and an ounce of paraffin oil should be taken three times a day for the same purpose.

A vigorous sweating bath at the beginning of the disease is essential. The sweating may be repeated several times a day in the early stages.

The short hot bath (see index) and the hot blanket pack induce vigorous sweating and are efficient means of combating the fever and of relieving the pain in the back and the legs. Fomentations should be applied to the chest twice a day, with a chest compress (see index) between applications.

The hot blanket pack consists in wrapping the patient in a blanket wrung out of water as hot as the patient can bear. A dry woolen blanket should be applied outside the wet blanket. The duration of the pack should be twelve to fifteen minutes. Care should be taken to cool the head and face of the patient, and keep an ice-bag over the heart if the pulse is rapid. When the temperature is high, the duration of the pack should be shorter, say four or five minutes.

Headache may be combated by a cold compress to the head. Care should be taken to wet the hair thoroughly, and to apply the compress in such a way as to cover the entire back part of the head as well as the front part.

If the fever runs high, the cold pack may be used as a means of lowering the temperature. It should be applied immediately after a very short hot blanket pack.

When the Acute Attack Is Over

First of all, don't be in a hurry to get up. A few days in bed after all symptoms have disappeared and the strength seems to be returning will possibly avert an impending attack of pneumonia or at least prevent the imprudence which may precipitate an attack or relapse. The importance of rest for some days after convales-

cence seems to be established is universally recognized.

After pneumonia, a longer rest is required. Time must be given for complete clearing up of pleuritic patches and the points of infection scattered through the lung. A week or two in bed may really shorten the time required for recovery by several weeks or months.

After getting up, great care must be taken to avoid fatigue and exposure. The body has been through a severe storm, and time is needed for recuperation. Premature return to work is most unwise. The bad effects will be most likely to appear weeks or months later in a gradual decline or an unexpected collapse. Vital stamina and resistance are greatly reduced, and these are recovered slowly. A long vacation and most scrupulous attention to health building are essential.

Special attention must be given to the care of the bowels. By the free use of coarse food, bran, agar agar, and an ounce of paraffin oil before each meal the bowels may generally be made to move three or four times a day, which is desirable. If necessary, an enema at 80° F. may be used to insure complete emptying of the bowel.

Meats of all kinds must be avoided. Eggs may be used in moderation, but must be cooked. The yolk is far superior to the white of egg.

Milk, especially buttermilk and fresh cream, with the free use of good butter, are important aids to blood and tissue rebuilding.

Finally, the patient should live in the open air, night and day. Exercise must be carefully graduated, always stopping short of fatigue.

The morning cold bath, the tepid evening bath, and skillful daily massage are invaluable aids.

When possible, the influenza convalescent may spend a few weeks at a well-organized and scientifically conducted sanitarium with great advantage.

Lathyrism

Q. **What is the disease known as lathyrism?**

A. Stockman describes a disease called lathyrism which is caused by eating certain species of peas. The symptoms do not appear at once after the peas have been eaten but some time later. They manifest themselves in the form of a partial paralysis of the legs which causes the person afflicted with the disease to roll the body from side to side as he walks. The feet are with difficulty lifted from the ground so that the toes drag in taking a step. In the more severe cases the patient cannot stand even with the aid of two sticks. In the milder forms he is able to walk by the aid of two sticks, but has the characteristic walk of this disease, i. e., rolling the body from side to side and dragging the toes. Men are more afflicted than women in about proportions of 12 to 1. There are various opinions given for this, the chief being that men eat more than women and also are more exposed. Some people are more susceptible than others to this poisonous alkaloid in peas, for some members of the same family may be stricken and others escape. In its most severe form it seems to have no remedy. Those less seriously afflicted recover after a time.

Nutmeg Poisoning

Q. **Is nutmeg a wholesome condiment?**

A. No. In general, all condiments are unwholesome, at least, if they are irritating in character. The oil of nutmeg is less irritating than mustard or pepper, but is nevertheless a poisonous substance.

Nutmeg contains from three to eight per cent of the oil.

According to Leidy, "Wallace (1903) collected twenty-five cases with one death; the quantity ingested approximated from one to one and one-half grated nutmegs. One case of poisoning is reported after the ingestion of one drachm of mace. The symptoms developed in from one to six hours. There is drowsiness, passing into stupor, from which the patient can be roused with difficulty; he is unable to recognize his surroundings. Diplopia has been observed, with evidence of mental depression; at times there is marked excitement and delirium before the stupor suggestive of cannabis indica poisoning. Sometimes the first symptom is abdominal pain, attended with precordial distress and giddiness; in two cases alarming collapse occurred. The stupor lasts from four to six hours, passes off, and the patient recovers. The only death recorded is in a boy of eight, who swallowed two nutmegs and became comatose, from which condition he could not be aroused, and died in twenty hours."

Dale observed fatty degeneration of the liver, which developed several days after apparent recovery in animals, being preceded by jaundice.

Two nutmegs weighing approximately ten

grms., (⅓ oz.) containing one grm. of the essential oil, caused poisoning in animals.

It is important that housekeepers should know these facts about nutmeg and mace, and it is very proper to ask if their use should not be discontinued. It is known that the long-continued use of poison even in very minute doses, ultimately produces degeneration of the blood-vessels. This is especially true of poisons of the class to which nutmeg belongs, as shown by Huchard.

Itching Anus

Q. **What is a good remedy for itching of the anal region?**

A. About 10% of all persons suffering from rectal diseases complain of an intolerable itching about the anus. All sorts of remedies have been prescribed for the cure of this disposition, but with only partial success. These methods have included removal of the affected portions of skin, cauterization, destruction of the nerves by division, X-ray applications, and local applications too numerous to mention.

For some years a suspicion has existed that this distressing condition might be due to an infection of the skin. Certainly there is no part of the body more exposed to infection than is this region. Curiously, this is especially true of civilized people. The methods of cleansing the parts after evacuation, by means of paper, leaves the surface covered with fecal matter which consists in large part of bacteria. The native Hindu cleanses the anal region with water and a cloth. For complete cleansing, soap and water and a cloth are necessary.

Recent studies of this condition by Mummery of London and Murray of Syracuse have shown quite clearly that the disease is due to infection of the skin with streptococcus fecalis, a germ always found present in great numbers in the feces at least under ordinary conditions of diet and colon care.

Mummery has found benefit from the application of a 2% solution of iodine in 75% alcohol. This is applied to the affected region with great thoroughness.

Murray has found benefit from the use of an autogenous vaccine.

The writer has for some time regarded this disease as due to an infection from the feces, and has met with a very considerable degree of success by the following method:

1. Thorough cleanliness. After each evacuation the anal region parts are thoroughly cleansed with soap and water. The soap solution should be as hot as can be borne without injury to the skin. The soap solution is removed by the free application of pure warm water.

2. Application of a special bacterial culture containing the Bacillus Bulgaricus, the B. Acidophilus, the streptococcus lactis, and the B. biffidus, all of which are active producers of lactic acid.

In the presence of these acid-forming bacteria the bacteria which give rise to pruritis ani as well as other disease-producing bacteria are unable to grow, and speedily die out. The lactic acid and some of the bacteria, being able to penetrate the skin, reach the infecting germs hidden in the deeper layers of the skin, to which are due the

intolerable and uncontrollable itching. In some cases the relief afforded by this treatment is almost immediate and complete; other cases require prolonged treatment. Buttermilk may be used in place of the above culture.

For temporary relief hot water is almost a sovereign remedy. Apply with a sponge or napkin dipped in water of a temperature of 125° to 130° F., in a touch and go fashion, as hot as possible without making a blister.

Carbon Monoxid Poisoning

Q. **What is carbon monoxid, and under what circumstances is one likely to come in contact with it?**

A. When carbon is completely burned or oxidized, it is converted into carbon dioxid; that is, one carbon atom combines with two atoms of oxygen. Under certain conditions the combustion is incomplete and then the carbon combines with only one atom of oxygen. Such a combination is known as carbon monoxid. Carbon dioxid is not an actively poisonous substance. It is injurious chiefly because it replaces oxygen, but carbon monoxid is a highly active poison. It damages the body by combining with the red cells and preventing them from taking up oxygen in the normal way.

It was formerly supposed that this combination was a permanent one. It is now known, however, that this is not true. The carbon monoxid may be eliminated from the blood by the breathing of pure oxygen, or if the quantity absorbed is not large, by the practice of deep breathing exercises.

Recent researches have shown that poisoning by carbon monoxid is much more frequent than has been heretofore supposed. More than five hundred persons meet their death from poisoning by this noxious gas every year in the city of Chicago alone. The number for the whole country must be quite large. It is, indeed, believed to be larger than from any other single poison.

The most common source of poisoning with carbon monoxid is ordinary illuminating gas. Ordinary gas coal contains four to ten per cent of carbon monoxid. So-called water gas contains thirty per cent, and producer gas, twenty to thirty per cent.

Natural gas as it comes from the earth does not contain carbon monoxid. Many cases of poisoning occur from the use of gas stoves and gas burners through the leaking of gas from the joints. The use of rubber for the packing of joints is highly objectionable because of the readiness with which such joints leak.

A very common cause of poisoning with this gas is from the exhaust gases of automobile engines. Of course, there is no danger from this source when the automobile is operated out-of-doors, but if the engine is run when the car is shut up in the garage, the air of the room may be very quickly charged with carbon monoxid in poisonous proportions. Several deaths have occurred from this cause. A man was found dead sitting in the seat of his automobile with the engine running, in a closed garage. Another man fell unconscious just outside the door of his garage. He was led to leave the room because

of unpleasant symptoms. He died within forty-eight hours. Numerous similar cases have been reported.

Light Treatment for Old Sores

Q. **How may old sores be made to heal?**

A. There are various ways of stimulating repair in old sores, or chronic ulcers. One of the best is through the use of light.

An eminent French surgeon reports remarkable results in old wounds by covering the surface with vaseline and exposing to the sun or electric light daily. Treated by this method, varicose ulcers, obstinate unhealed burns, and other old sores are said to heal very rapidly, often closing at the rate of nearly half an inch a day. Large surfaces sometimes heal over completely in a week.

Vaseline protects the surface, permits escape of secretion, and does not interfere with the application of the light. This seems a very natural method, and well adapted to general use.

Another excellent plan is the application of soft cloths kept moist with sour whey to which a little molasses has been added.

The Morning Headache

Q. **Why does one suffer from morning headache?**

A. One of the most common and perhaps the most pernicious of all causes of morning headaches is constipation or intestinal stasis.

That constipation produces headache is a fact which must be known from personal experience by almost every civilized human being, for there

are probably few adult persons who do not suffer more or less from the consequences of this form of intoxication. The poisons already mentioned, tea, coffee, tobacco, and sleep-producing drugs, are bad enough, and the fatigue poisons normally developed in the body are likewise pernicious, but most potent for mischief of all are the poisons produced in the colon by the growth and activity of the "wild bacteria" which find entrance through an unnatural and disease-producing habits of eating. Most of the one hundred and sixty different species of germs which thrive in the alimentary canal produce highly poisonous substances, some of which even resemble the venom of snakes in their virulence. When the food residues or the normal secretions of the liver and other digestive glands are retained more than a few hours in the colon, in which they are deposited by Nature for prompt dismissal from the body, they undergo putrefactive changes, and are converted into deadly poisons by the myriads of bacteria, amounting to many trillions, which prey upon them.

The normal rythm of the alimentary canal will secure at least three evacuations of the colon daily. Food is Nature's laxative. The peristaltic waves set up when food is taken into the stomach stimulate the action of the colon and render its movements four times as active as during the interval between meals. Unfortunately, most civilized human beings are like house dogs, house-broken. Constipation is cultivated to suit the demands of modesty and convenience. From our earliest consciousness, we are taught to restrain the bowels from acting instead of

encouraging and facilitating their action. By this means the natural and automatic discharge of food residues and excretions is upset, and the result is an accumulation of putrefying material in the colon. The colon becomes overstretched, the cecum enormously dilated and pouched, and in many instances the colon becomes so crippled that it is no longer able to empty itself without mechanical assistance.

Thousands of persons are suffering from the effect of dilatation of the cecum, or adhesions of the appendix or cecum which prevent this part of the colon from rising and passing its contents on to the lower part of the colon, Nature's sewage discharge mechanism. Such persons suffer from the effects of constipation even if the bowels move regularly several times a day. Notwithstanding these frequent bowel movements, the colon is never completely empty. There is always retained in the dilated head of the colon, or cecum, highly putrescent material which is continually sending into the body tissues a flood of poisons more mischievous in their effects than alcohol, tobacco, tea, coffee, or any other poisons to which human beings are commonly exposed. Such persons are very likely to suffer from morning headache because the body is so charged with colon poisons, a condition of chronic intoxication even worse in its pernicious effects than alcoholic intoxication, both because of the high degree of virulence of the poisons produced, and their constant presence in the tissues.

The remedy is to be found in the free use of bran, paraffin oil, and such bulky foodstuffs as

greens, fresh vegetables and fruits, and, in addition, the complete, mechanical emptying of the colon by enema every night before going to bed. The temperature of the water should be from eighty to ninety degrees and the quantity one to two pints. The water should be slowly introduced, and should be retained five or ten minutes so as to give it time to reach the head of the colon. If the water is not readily expelled, it should be managed somewhat differently. The first pint administered should have a temperature of 102 to 104 degrees; this to be followed by a second pint at a temperature of 80 to 90 degrees. The warmer water will relax the contraction of the lower colon very commonly present in cases of this sort and so encourage evacuation. Such an enema taken at night will not interfere with the morning bowel movement, but will rather have the opposite effect. This measure used on retiring will, in the majority of cases, not only eliminate the morning headache, but will also create an appetite and dissipate the depression, confusion, and other distressing symptoms which are the common accompaniment of the matutinal headache.

Injury from Sun Heat

Q. **Why is the heat of the sun injurious to some people under some circumstances when otherwise harmless?**

A. From recently conducted experiments, it appears that it is possible for one to become inmune to the injurious effects of sun heat.

"Several years ago Aron, then professor of physiology in the College of Medicine and Surg-

ery at Manila, reported an almost surprising series of observations on the susceptibility of the monkey, a tropical animal, to harm from direct exposure to the sun in the Philippines. Animals were reported to have died in many cases in from seventy to eighty minutes when placed on the ground in the Manila sun, even in the coolest months of the year. Shaklee, pharmacologist at the University of the Philippines, has verified the observation that unclimatized Phillipine monkeys exposed to the sun in Manila may die of heat stroke in the course of a very short time, depending on conditions.

"Factors that must be taken into account in any attempt to determine the cause of a rise in body temperature or of death following exposure to the sun are the energy of the solar rays, and the temperature, the movement and the humidity of the air. Shaklee finds by direct observations that the conditions making for a rapid death are a hot sun; proximity of a large hot surface, such as the ground or a roof; high relative humidity of the atmosphere, and a low wind velocity. Under such circumstances death is due to an accumulation of heat in the body.

"The novelty in Shaklee's studies is the finding that monkeys can apparently be acclimatized to the conditions mentioned, if exposure to them is gradual. This is of signal importance in relation to the comparable possibilities in the case of man; for the human organism seems in many ways far better adapted than a monkey's to resist the tropical climate. Shaklee points out that the temperature-regulating mechanism in man is much more sensitive than that in the monkey,

as shown by the smallness of the normal variation of the body temperature in man as compared with that in the monkey. The sweating mechanism in man has many times the capacity of that in the monkey, and as the temperature of the surrounding atmosphere approaches the temperature of the body, this becomes the most important means of eliminating heat from the body. The internal heat production of man on a light diet is smaller in proportion to body surface than that of the monkeys subjected to this experiment. Man stands higher above the hot surface on which he rests or moves; hence he would receive less heat from the ground and be subjected to a more rapid movement of air over the body surface than would the monkey. Man's body has much less hair than the monkey's; hence the escape of heat from his body by radiation, conduction or evaporation is less interfered with. Man can so select and arrange his clothing that it will interfere little with the escape of heat from his body, while at the same time it will shield the body from the heat rays coming from the sun. Moreover, man is acquainted with a larger variety of foods.

"The acclimation to the tropical climate as experimentally accomplished in the case of the monkey appears to be due essentially to an increase in the sensitiveness of the nervous mechanism that regulates body temperature. This results in an increase in the rate or efficiency of sweating, producing what has perhaps falsely been termed an immunity. The 'immunity' is readily lost if the subjects are kept in the shade. In harmony with the explanation

advanced above is the fact that a small dose of atropin, which diminishes the action of the sweat glands, as well as other secretory structures, suffices to nullify the effect of any acclimatization and to cause the death of an acclimatized animal by stopping perspiration. The inference is further supported by the fact that when the relative humidity of the atmosphere is great, even acclimatized animals exhibit a tendency to a markedly greater rise in body temperature. Finally, attempts to acclimatize rabbits—a species not known to perspire—have thus far entirely failed.

"Evidence has begun to accumulate that healthy white men may be readily acclimatized to the tropical climate at its worst. Shaklee maintains that the amount of sweating necessary to keep the body temperature of a healthy white man from rising above normal is not excessive, even when the man is doing considerable physical work in the midday sun in such a tropical climate as that of Manila, provided the man has been sufficiently long on a suitable diet and introduces himself gradually into the work in the sun. In the acclimatization of the white man the most important factor is the proper regulation of the diet. The effects from the tropical sun seem to be exactly the same as the effects from the sun in the United States; that is, no effects were seen or felt in these experiments that were different from what would have been expected under like circumstances in the northern portion of the United States."

Sprains

Q. **What is the quickest way to relieve pain in case of sprains?**

A. For the pain of sprains and bruises, administer very hot applications followed by cold compresses or ice bags. The fomentation may be renewed every fifteen minutes for two or three hours, the cold compress being maintained in the interval. Apply a bandage.

Pelvic Pain

Q. **How may one relieve an almost continuous pain in the pelvic region?**

A. Pain in the pelvic region can in many cases be relieved by the use of a hot enema. The application may be repeated several times a day. The quantity of water introduced at once should not be more than one or two pints, as the application is designed for the organs of the lower abdomen and the pelvis. The water should be retained five minutes, when it may be allowed to escape, and a fresh quantity introduced, this being repeated from three to six times. It is not necessary to remove the rectal tube; by detaching the tube from the fountain, and lowering the end, the water will escape into a suitable vessel. The patient should lie on the back with the shoulders raised. Allow the water to pass in slowly.

Pain Below the Shoulderblades

Q. **What is the cause of pain just below the shoulderblades?**

A. This pain is usually the result of a diseased condition of the stomach or the stomach

and gall-bladder. In case of gall-bladder disease, tenderness is almost certain to be found not only under the right ribs where the gall-bladder is situated, but also at a point in the spine nearly opposite. This condition is known as reflex pain or tenderness; it does not signify a diseased condition of the spinal column or of the spinal cord or nerves. It is a "referred tenderness" and is due to sympathetic or reflex irritation.

Pain-Relieving Drugs

Q. **Is there any drug which can be used for the relief of pain without producing injurious effects?**

A. No. Even such drugs as phenacetin, codeine, and aspirin are harmful. They relieve pain momentarily but later increase pain. The cause of the pain must be removed, then it will disappear.

Mineral Waters

Q. **Why are mineral waters harmful? Are they not Nature's healing remedies?**

A. Laxative mineral waters are harmful, because they irritate the mucous membrane and in time produce intestinal catarrh. They also expose the liver and kidneys to the harmful effects of overwork. Mineral waters are no more natural healing agencies than are minerals themselves. No one would think of recommending iron pyrites or limestone as a healing agent; neither are the great salt beds or alkali deposits regarded as natural healing agents. Mineral waters are simply rain water which has been contaminated by coming in contact with various mineral substances while percolating through the earth.

To call mineral waters "Nature's healing remedy" is a great misapplication of terms, and is an error which grows out of a misapprehension of what a natural healing agent is. Nature's healing remedies consist in those forces or agencies which are essential for the maintenance of life, and which are in constant use in carrying forward the ordinary life processes. The curative or therapeutic application of these remedies consists in so utilizing them as to intensify or concentrate the effects which they ordinarily exercise upon the body. Mineral waters are in no way beneficial to a healthy man. They may in some instances prove of temporary service in emergencies, but their constant use is now recognized as being highly detrimental. Many European physicians who formerly recommended mineral waters very freely to their patients, now condemn their use for the reasons above stated.

There are many excellent natural waters which are remarkable for their extreme purity or freedom from both mineral contamination and germs or bacteria. Such waters may be used freely, not only without harm, but even with very great safety and advantage.

The Wassermann Test

Q. **What is the nature of this test and is it reliable?**

A. The Wassermann test is employed to determine whether a person is suffering from syphilitic infection.

The test consists of obtaining a portion of the patient's blood and subjecting this to certain laboratory tests. When carefully done the test

is found to be remarkably reliable. In certain cases the spinal fluid is used for making the test instead of the blood.

It is important to know that a "positive" Wassermann reaction is no evidence of immorality or vicious conduct. Syphilis has become so widespread that the disease may be quite easily contracted by accidental contract with the infection, either directly or indirectly. The disease is in many cases inherited.

Aspirin

Q. **Is aspirin a harmless drug?**

A. By no means. All drugs are more or less harmful. The growing practice of dosing with aspirin whenever one may feel a twinge of pain, which may be attributed to rheumatism or neuralgia is greatly to be deplored. Rheumatism or neuralgia are usually due to some error in one's habits of living. Aspirin only conceals the difficulty without removing its cause. Increased bowel activity, the disuse of meat, tea and coffee, warm bath at night, more exercise in the open air—these are measures which will in most cases cause quick disappearance of painful symptoms and will leave no unpleasant effects behind. A hot fomentation or hot water bag over the seat of pain will very likely afford relief. Do not dope! All drugs are unfriendly to the tissues and do more or less harm when freely used. Some drugs are highly injurious in even very minute doses. Aspirin is less injurious than morphine but not harmless. Cases of chronic aspirin poison from the continued use of the drug have been recently reported

The Asperin Habit

Q. **Is there any harm in the frequent or habitual use of aspirin?**

A. The frequent prescription of aspirin by physicians for the relief of neuralgiac or rheumatic pains has made the drug familiar to the public, and not a few persons are acquiring the practice of taking the drug for almost every disagreeable symptom or pain from any cause. The *Journal of the A. M. A.* reports the case of a man who in this way acquired the aspirin habit, and naturally increased the dose which was necessary to obtain the desired relief, until he was taking 60 grains a day. Very naturally, he was found suffering from indigestion, constipation and low blood pressure.

The habitual use of any drug does serious harm, for the reason that drugs are foreign substances, generally more or less poisonous, and the liver and kidneys are worn out in eliminating them.

Strychnia

Q. **Is strychnia a good tonic?**

A. No. There is no drug which can properly be called a good tonic. Strychnia has for generations been the popular tonic. Countless thousands have been deceived by its delusive effects. Erroneous conceptions were responsible for the false confidence reposed in this powerful nerve excitant. Modern studies of nutrition have clearly demonstrated the futility of attempting to find any substitute for the vital energy generated by healthy cells acting under the influence of normal or physiologic stimuli. The apparent in-

crease in vigor which follows a dose of strychnia is not due to an actual addition to the sum of the bodily energies, but is simply the result of a forced expenditure of energy which is already depleted to the point of danger. Strychnia, and other similar drugs, are simply devices for getting energy out of a man which he cannot afford to spare, and which he ought to keep.

Veronal

Q. **Is veronal a harmless drug?**

A. No indeed, it is not a harmless drug. It disturbs digestion and disturbs the nerves and is a foreign body which must be eliminated by the kidneys, which are thus compelled to do unnecessary work.

Castor Oil

Q. **Is the use of castor oil harmful?**

A. The frequent or habitual use of castor oil gives rise to colitis and produces very obstinate constipation. The same is true of other medicinal laxatives. Castor oil is rarely useful and cannot be used habitually without in the end doing much harm. Paraffin oil or paraffin in some form and the free use of bran or agar-agar are safe and efficient means which when properly employed obviate the necessity for the use of castor oil or other laxatives in nearly all cases.

Dangerous Patent Medicines

Q. **Are patent medicines harmful?**

A. Hundreds of deaths occur annually as the result of patent medicines. Thousands become addicted to alcohol and other drug habits by the use of remedies containing these poisons.

Cod Liver Oil

Q. **Is cod liver oil necessary in the treatment of consumption or any other disease?**

A. Cod liver oil is a time honored remedy the value of which has been overrated. Sweet cream, sterilized butter, olive oil, oil of almonds, and other vegetable oils are in every way superior to cod liver oil.

The Opium Habit

Q. **Can the opium habit be cured without drugs?**

A. The opium habit and other drug habits are very seldom cured by the use of drugs. Any method to be successful must restore the patient's nerve tone and build up his vital resistance and remove the causes of the suffering for the alleviation of which the drug is employed. This can be done without drugs.

Cascara

Q. **Is cascara a harmless laxative?**

A. One of the most unfortunate results of chronic constipation is its by-product of drug habits. There are many substances, of course, that brings about action of the bowels with much promptitude, and with such evident relief that the sufferer resorts to the same remedy on the next occasion, without stopping to inquire whether the drug might not be as dangerous as the disease. The chances are he does not stop to consider the matter one way or another, but falls an easy victim to the habit of drug taking.

One of the most vicious of these vile substances is cascara. which contains irritating

poisons, among them a substance known as anthracin, which is extremely poisonous, and which may, if used for some time, produce colitis.

At one time the writer discussed this matter of constipation and the drug habit with an eminent European physician, and the distinguished scientist said: "There is nothing so bad as the chronic use of drugs." And when asked about his method of treatment in cases of bad constipation he said: "I regulate the diet."

Diet Schedule for Diabetes

Q. Is there any reliable rule of diet which a diabetic patient may follow after getting the urine free from sugar by fasting?

A. Yes. The following schedule has long been in use at the Battle Creek Sanitarium in such cases, though, of course, some variations are necessary to suit individual cases:

Diabetic Diet Schedule

Energy intake calculated for body weight of 130 pounds (59 kilos).

	Carbohydrate		Protein		Fat		Total		
Day	Cal.	Cal. per pound	Cal.	Cal. per pound	Cal.	Cal. per pound	Cal.	Cal. per pound	Cal. per kil.
1	65	.5	195	1.5	260	2.0	520	4.0	8.8
2	130	1.0	195	1.5	390	3.0	715	5.5	12.1
3	195	1.5	195	1.5	520	4.0	910	7.0	15.4
4	260	2.0	195	1.5	650	5.0	1105	8.5	18.7
5	325	2.5	195	1.5	780	6.0	1300	10.0	22.0
6	338	2.6	195	1.5	845	6.5	1378	10.6	23.3
7	351	2.7	195	1.5	910	7.0	1465	11.2	24.6
8	364	2.8	195	1.5	975	7.5	1534	11.8	26.0
9	377	2.9	195	1.5	1040	8.0	1612	12.4	27.3
10	390	3.0	195	1.5	1105	8.5	1690	13.0	28.6
11	416	3.2	195	1.5	1170	9.0	1781	13.7	30.1
12	442	3.4	195	1.5	1235	9.5	1872	14.4	31.7
13	468	3.6	195	1.5	1300	10.0	1963	15.1	33.2
14	494	3.8	195	1.5	1300	10.0	1989	15.3	33.7
15	520	4.0	195	1.5	1300	10.0	2015	15.5	34.1
Work ration	650	5.0	195	1.5	1560	12.0	2405	18.0	39.6

Testing the Urine in Diabetes

Q. **What is the method employed for testing the urine in diabetes for sugar and harmful acids?**

A. The following method of procedure is recommended in *"The New Method in Diabetes"*:

Collection of the Specimen

Use for the purpose only glass jars or bottles which have been thoroughly cleansed and scalded with boiling water. During the collection keep the jar well covered and in a cool place. The specimen to be analyzed should be taken from a 24-hour collection. This is obtained in the following manner:

Empty the bladder at the usual time of rising in the morning, say 7 A. M. This is to mark the beginning of the collecting period. Hence, this passage is *not to be saved* (unless the urine is collected daily in which case this passage will of course be the last to be saved for the specimen of the day before). Then carefully save all the urine passed until 7 A. M. the next day, taking care to completely empty the bladder at the last-named hour. If the quantity is large and requires several containers to hold it, the whole of the 24-hour collection should be poured into one vessel, large enough to hold it all so as to secure thorough mixing. Note the total quantity, measuring very accurately. If it is desired to send to the laboratory a specimen for complete analysis, fill a perfectly clean bottle or jar, holding at least one pint, with the mixed urine, seal properly and label with the patient's name and

the total quantity of urine passed. Add half a dram of toluol to preserve.

The following tests should be made:

1. *The specific gravity.* Place enough urine in the cylinder to float the urinometer. Take the reading just below the surface of the urine. The urine tested should be at the ordinary room temperature, which will be the case if the specimen has been standing in a room of ordinary temperature for some hours. The normal specific gravity is 1016 to 1020. A high specific gravity is ground for suspecting sugar. As the sugar of the urine diminishes, the specific gravity falls.

2. *Diacetic acid.* Five c. c. of the urine (a large tablespoonful) is placed in the test tube. Add, drop by drop, the ferric chlorid solution as long as a precipitate forms. Filter, and to the filtrate add a few drops more of the ferric chlorid.

If diacetic acid is present a violet-red color will be obtained.

This test can be made without filtering, as follows:

To three or four c. c. of urine (a small teaspoonful) in the test tube, add an equal amount of ferric chlorid. If diacetic acid is present, the violet-red color will appear. This color may be due to other substances; but if on heating the mixture the color fades, this indicates that the color was due to diacetic acid.

3. *Test for Sugar in the Urine.* To test for sugar five c. c. (a large teaspoonfud) of the test solution is placed in a test tube. Add eight to ten drops, not more, of the urine to be tested.

While shaking, the mixture is heated to boiling and is kept at this temperature for two minutes, or the tube may be held in boiling water for five minutes. It is then allowed to stand until cool. In the presence of sugar, the entire body of the solution will be filled with a precipitate, which may be *red, yellow,* or *greenish* in tinge. If the quantity of sugar is low (under 0.3 per cent), the precipitate forms only on cooling. If no sugar is present, the solution either remains perfectly clear or shows a faint turbidity that is blue in color.

The Care of the Teeth

Q. **What is the cause of decay of the teeth, and how may the teeth be preserved?**

A. There are many reasons why the average American is losing his teeth. Here are a few:

1. He eats too fast. That is, he doesn't take time to chew his food.

2. He eats soft food which requires no chewing, so that he is able to gulp it down without the use of his teeth. Unused organs always deteriorate and decay.

3. His food lacks lime, a constituent absolutely necessary for the teeth, the hardest structures of the body. Bacon, beefsteak, fish, oysters, butter, lard, fine flour bread, corn meal, rice, most breakfast foods—in fact, nearly all the refined and dainty foodstuffs which appear on the bill of fare of the average citizen—are almost altogether lacking in lime.

4. He eats food which contains little or no roughage, and in consequence is constipated as

a house-broken dog and suffers from autointoxication, which gives him a coated tongue, foul breath and foul mouth, a hold of unclean and hateful germs which prey upon the teeth and attack the gums, and produce abscesses at the apices of the teeth, and fill the body with multitudinous maladies which damage every structure from brain to toes.

Chew as fast as you like, but don't swallow so fast. Keep the food longer in the mouth. Give the salivary glands time to secrete their wonderful fluid, the saliva, which not only moistens the mouth, lubricates the food, converts starch into sugar and prepares the way for stomach digestion, but at the same time protects and nourishes the teeth, and disinfects the mouth, or at least when healthy, through being formed in abundance from healthy blood, which prevents the growth of bacteria in the mouth.

Eat dry and hard food which requires the exercise of the chewing muscles. This will bring an abundant supply of blood to the salivary glands out of which to make saliva, and will stimulate the flow of the disinfecting fluid, and, besides, will polish and scour the teeth and so hinder the formation upon them of the "films" of food and mucus under which hide the insidious germs which bore holes in the teeth and gnaw away the gums until the teeth drop out.

Eat every day—better every meal—a liberal amount of something known to be rich in food lime. Greens, such as spinach, turnip tops, greens once or twice a day.

Milk and cottage cheese are also rich in lime. Twenty ounces of milk or three ounces of cheese contain a day's ration of lime.

Eat bran—a big tablespoonful every meal. Don't be afraid of eating too much. Bran is not irritating. It does not hurt the mouth and won't hurt the stomach or any other part of the intestinal machinery. Wet bran is like wet paper. It does not scratch, it only tickles.

Bran is not only good roughage, but it is rich in lime, iron and other things needed to keep the body in health. If bran is not sufficient, then add mineral oil in some form, not once in a while, but a spoonful or two or three at every meal, not missing one.

Avoid laxative drugs of all sorts. They cause temporary relief, but contract the bowel, render the constipation more obstinate and thus do great injury when habitually used.

Dead teeth are a constant menace. Some of the best dental authorities insist that a dead tooth should never be allowed to remain in the mouth, and that a tooth which cannot be saved without destruction of the nerve should be drawn.

Bridgework is often objectionable on several grounds, particularly because of the accumulation of food and detritus beneath the bridge and because of the almost certain destruction of the teeth to which the bridge is attached on account of the abnormal strain to which they are exposed. These objections, however, do not apply to removable bridgework, which

represents the highest attainment of the dental art.

Keep the teeth clean, but don't depend solely upon the toothbrush. Some dental authorities nowadays condemn the toothbrush altogether, and hold it responsible for some of the worst forms of mouth infection Often the bristles get loose and work into the gums and carry infection and work into the gums and carry infection deep into the tissues.

Buy a new toothbrush every three or four weeks. Brushes become badly infected within a week or two and carry germs into the mouth instead of removing them. (See New Hygiene of the Teeth, p. 175.)

The Source of Colon Poisons

Q. **What is the cause of colon poisons, or toxnis?**

A. Colon poisons are the result of the putrefaction of the food residues or of the intestinal secretions. Some are produced by the decomposition of fats and bile and mucus, but the worst poisons result from the putrefaction of protein, particularly animal substances, such as meats, fish, oysters, eggs, cheese and other dairy products.

Milk, on account of the large amount of sugar of milk present, is less liable to undergo decomposition than other animal products.

Raw white of egg is not digested, and hence promotes putrefaction to a high degree.

The flesh of animals is usually in a state of advanced decomposition when it is eaten, and

hence encourages putrefaction both by furnishing putrescible material and by introducing putrefactive germs.

Many different germs produce colon poisons. Of the one hundred and sixty different species of bacteria which have been found in the intestine, more than one-third are poison-formers. *B. putrificus* and *B. streptococcus entericus, B. Welchii, B. proteus* and *B. coli* are among the most common causes of putrefaction and poison-formation in the colon.

Known Colon Poisons

Q. **What poisons are definitely known to originate in the colon?**

A. Among the many different poisons which are known to be formed in the colon, the following have been definitely identified and shown to be highly injurious to the body:—

Cholin, a highly virulent toxin.

Ammonia, which causes degeneration of the liver.

Tyramine, a highly poisonous substance sometimes found in cheese.

Indol and *skatol,* formed from tryptophane and arginine. It has been shown that these poisons produce hardening of the arteries within three or four months, when given to animals daily in small doses.

Sepsin, a virulent poison always found in putrid meat and in the colons of meat-eaters. It is so highly poisonous that a minute dose will cause the death of a large dog in a very few hours.

Hydroxyl-phenyl-ethylamine causes fatty de-

generation of the heart and arteriosclerosis in rabbits. It has also been shown by Harvey to cause neuphritis and destructive changes in the kidney, either when injected into the tissues or taken internally. Changes in the kidney resemble the large white kidney of Bright's disease in men.

Phenylsulphate causes degeneration of the bloodvessels, liver and kidneys in four months, when given in small doses daily, in rabbits, guinea pigs and monkeys.

Paracresol causes the same effects as the above.

Phenol (carbolic acid) and *creosote*, the same as the above.

Para-hydroxyphenylethylamine, which causes hardening of the arteries and high blood pressure.

Iso-amylamine, the same as the above.

Beta-imidazolethylamine causes fall of blood pressure. This poison is never produced in the presence of carbohydrates and acids. (Barger and Dale.) It is especially active in cases of colitis. Is very abundant in meat-eaters, in which it is found in the mucous membrane of a great part of the intestinal tract.

Neurin, a very active poison, probably formed by the decomposition of cholin, which is in turn produced by the breaking down of lecithin, which is found in large abundance in eggs. Rolleston tells of a physician who awoke every morning with the belief that he was ruined, and who recovered completely after he ceased taking an egg for breakfast.

Advantages of Malt Sugar for Bottle-Fed Infants

Recent studies of infant nutrition have shown that one of the reasons for the poor nutrition of very young bottle-fed children, as shown by failure to grow at the proper rate, is the lack of the growth-promoting vitamin which is found in abundance in mother's milk and in full cow's milk, but is necessarily diminished in proportion when water is added to the cow's milk diluting it. The dilution is of course necessary, but should be compensated for by the addition of the essential vitamin. This may be obtained from vegetable soup as, for example, by adding thin potato soup to the diluted milk.

Another and perhaps better plan is to use malt sugar in place of cane sugar. Cane sugar contains nothing but sugar and is intensely sweet. Malt sugar is less sweet—an advantage, because of this respect it more nearly resembles lactose, the natural sugar of milk.

Malt sugar also has the great advantage that it contains the precious vitamins in concentrated form as well as other things essential to nutrition. Malt sugar, in other words, is something more than sugar. Cane sugar is simply sugar—nothing more or less.

Malt sugar contains considerable quantities of lime and of iron. The last named element is an important addition to cow's milk, which is very often deficient in iron. In diluted cow's milk in fact, the amount of iron is so small as to be practically negligible. The young infant needs iron in building blood as it grows and as it in-

creases in size. This is an important particular in which malt sugar is superior to lactose or milk sugar, which contains no iron.

But malt sugar has still another important advantage which has only recently come to be appreciated, namely, the considerable amount of dextrin which it contains. Pavlov showed the great value of dextrin as a peptogenic substance, that is, a substance which actively promotes the digestive processes. This makes malt sugar of great advantage as an aid to the feeble digestive powers of the average infant.

Torrey, Rettger and others have recently shown that dextrin is one of the best of all substances for promoting growth of the protective germs. These are acid-forming germs which make their appearance in the colon of the breast-fed infant within a few hours after birth, the B. bifidus and B. acidophilus described by Tissier of the Pasteur Institute.

When cow's milk is fed, these essential protective germs tend to disappear, their place being taken by putrefactive germs which produce poisons and cause dark, foul-smelling stools, and produce fretfulness, restless sleep, lack of appetite, delayed growth and other symptoms of the chronic poisoning produced by the dangerous germs which, unfortunately, are always found in great numbers in cow's milk.

Torrey, experimenting with white rats, found that by feeding dextrin the protective germs could be restored within three or four days, the putrefactive germs disappearing almost wholly.

This is a discovery of very great importance and helps to explain the benefits derived from

the feeding of barley gruel, malt soup, potato soup and other preparations which contain more or less dextrin. In malt sugar, dextrin is found in greater abundance than in any other food suitable for young children, a fact which in part doubtless explains the great benefits which follow the substitution of malt sugar for cane sugar in the diet of bottle-fed infants, an observation which has led leading specialists in the care of children to recommend malt sugar as greatly superior to either cane sugar or milk sugar in infant feeding.

The malt sugar should be added to the milk or milk and water mixture in the proportion of one ounce to the pint.

Malt sugar is now obtainable at most drug stores. A reliable preparation is Meltose, which may be had either in powder or syrup form.

The Time for the Digestion of Different Foods

Q. **How long time is required for digestion?**

A. It is now well-known that the time required for the complete digestion of a mixed meal and the deposit of the indigestible and unusable residue in the colon, is eight to eight and a half hours. This important information has been obtained by the aid of the X-ray. By adding bismuth or barium to a meal, it becomes possible to visualize the food during its entire course along the alimentary tract from mouth to exit.

Beaumont and various others have constructed tables showing the length of time the food remains in the stomach. This time varies greatly

with different foodstuffs. So much depends, also, upon the quantity of food and other conditions that these tables are of comparatively little value. The duration of gastric digestion depends upon: 1, the quantity of food eaten; 2, the variety; 3, the degree of solubility; 4, whether or not well masticated and insalivated; 5, the activity of the stomach; 6, the time of the last meal, the time of digestion being greatly increased when the food of the previous meal is present in the stomach; 7, the condition of the gastric glands and nerves and the state of the gastric juice; 8, the amount of liquid taken with the food—much liquid tends to delay the emptying of the stomach; 9, the condition of the colon—constipation tends to slow gastric digestion; 10, the presence or absence of disease of the gallbladder or duodenum, which often causes pyloric spasm and slows the emptying of th stomach.

In general terms, it may be stated that the time required for the digestion of the several classes of foods is as follows:—

1. Meats cooked by broiling, roasting or boiling, 3 to 3½ hours. Some meats are more easily digested than others. The following table is given by Thompson in the order of greatest digestibility of different meats, beginning with the most digestible:—

"Oysters.
Eggs, soft-cooked, scrambled or omelette.
Sweetbread.
Some fish, boiled or broiled, such as white fish, shad, red snapper, weakfish, smelt.
Chicken, broiled or boiled.
Lean roast beef or beefsteak.

Mutton chops, boiled or roasted.
Squab, partridge, quail.
Bacon (crisp), lean ham.
Roast fowl chicken, capon, turkey.
Roast lamb.
Young venison.
Liver.
Corned beef.
Veal.
Salmon, mackerel, herring, bluefish.
Duck, goose and game.
Lobsters and crabs.
Pork.
Smoked, dried, potted or pickled fish and meats in general.

Fish and shell-fish require 2½ to 3 hours.

Hard boiled eggs digest in 3½ hours. Raw white of egg does not digest but undergoes putrefaction in the colon.

Milk, raw, 2¼ hours; when boiled, 2 hours.

Peas, beans, corn, beets, turnips and other vegetables, 3 to 3½ hours.

Potatoes, baked and mealy, 2½ hours.

Raw vegetables, as cabbage, lettuce, etc., 2½ hours or longer.

Apples, pears, peaches, berries, 2½ hours.

Well cooked cereals, hominy, rice, corn flakes, wheat flakes, 2 hours.

Growth

Q. **What is the cause of growth?**

A. There is reason to believe that growth is regulated by the secretion of the pituitary body, a small structure found at the base of the brain. This secretion seems to operate both to increase and to retard growth, the condition of its action being as yet imperfectly understood.

Growth does not occur at the same rate all

through life. During the first months after birth, an infant grows at the rate of an ounce a day, at which rate, if continued, a man would weigh, at twenty years of age, nearly five hundred pounds. At the end of the first year, there is a marked slowing in the rate of growth, which becomes more rapid again during the third, fourth and fifth years. Growth is then slower until the age of puberty, when a great acceleration of the growth process takes place, which continues until the adult stature is reached; at the end of adolescence.

There are thus three periods of rapid growth. This law seems to apply to other animals as well as to man.

Recent studies of the relation of food to growth have shown that in addition to the long well-known food principles, fats, carbohydrates, proteins and salts, there are subtle substances known as vitamines which have a highly important relation to growth. Some of these are soluble in fat (Fat soluble-A), and others in water (Water soluble-B). When either of these vitamines is deficient, growth and nutrition are impaired.

The dried thyroid gland of the sheep fed to tadpoles enormously increases the rate of growth, causing them to develop into frogs in a few days.

For further information concerning vitamines, see Index.

The Pituitary Body

Q. **What is the function of the pituitary body?**

A. The pituitary body is a small structure located at the base of the brain, which belongs to the system of associated glands found in different parts of the body which produce internal secretions, that is, substances known as "hormones," which exercise a remarkable control upon nutrition through influencing secretion, growth, etc.

The pituitary body has two distinct portions, an anterior and a posterior lobe. The anterior lobe produces a secretion which has been shown to have a remarkable influence upon growth. When deficient in children, there is a lack of development of the normal sex organs at puberty. This defect may be overcome by administrations of preparations of the pituitary body which are now furnished by pharmacists.

The secretion of the posterior lobe raises blood pressure, causes contraction of the uterus, of the intestines and of other involuntary muscles.

Extract of the posterior lobe is used by physicians to combat shock, stimulate intestinal activity and to cause uterine contraction. Harmful effects may result from the excessive use of these preparations, hence they should never be employed except under the direction of a physician.

Tethelin, the active constituent of the anterior lobe of the pituitary body, has been recommended as a means of promoting the healing of wounds.

Normal Physical Proportions

Q. **What are the normal physical proportions for height, weight, and chest measurements?**

A. The following is the standard adopted for men by the United States Army:

Height	Net Weight	Chest Measurement At Expiration	Chest Measurement Mobility
Inches	Pounds	Inches	Inches
64	128	32	2
65	130	32	2
66	132	32½	2
67	134	33	2
68	141	33¼	2½
69	148	33½	2½
70	155	34	2½
71	162	34¼	2½
72	169	34¾	3
73	176	35¼	3

Focal Infection and Rheumatism

Q. **What is the focal infection, and does it cause rheumatism?**

A. Focal infection is a term applied to diseased conditions which are the result of the extension of infection from some focus of infection, as a diseased tonsil, an abscess at the root of a tooth, pyorrhea or ulceration of the gums and other local infections.

It has been definitely proven that rheumatism, neuritis, neuralgia, headache, disease of the eye, disease of the gall-bladder, appendicitis, and even disease of the arteries and high blood-pressure, may be the result of an infection which

has its origin in a diseased tonsil or a diseased tooth.

Dead teeth and crowned teeth are a menace. The neglect of dentists to completely fill the root canals of teeth has often caused root abscesses and resulted in rheumatism and other grave disorders. Whenever any of these troubles are found present, an X-ray examination should be made of the teeth under the supervision of an expert dentist. If necessary, the teeth should be drawn.

The relation of diseased teeth to rheumatism and other diseases was first noted by the famous Dr. Benjamin Rush, one of the signers of the Declaration of Independence. In 1809, he reported a case of chronic rheumatism of the hip, accompanied by a severe toothache. He ordered the tooth extracted, after which the rheumatism left the hip and the patient was well in a few days, and remained well. Many remedies had been previously used without relief.

Dr. Rush reported a case of dyspepsia cured by the removal of a diseased tooth and a case of epilepsy cured in the same way. He refers to cases of vertigo cured by the removal of diseased teeth, reported by Mr. Darwin and other remarkable cures reported by Dr. Pettit, an eminent French Surgeon.

Sprains

Q. **What is a sprain, and how may it be relieved?**

A. A sprain consists of a laceration or rupture of the ligaments surrounding and supporting the joints, in consequence of unnatural

strain brought to bear upon them. To relieve the pain, apply fomentations; to prevent inflammation, apply cold after the pain is relieved. In some cases, cold applications give more relief than hot. A smooth roller bandage should be applied as soon after the accident as possible. The most recent and successful method of treating sprains is by means of massage, very light at first, and gradually increasing in vigor from day to day, beginning the next day after the accident. Baths and bandaging may be advantageously combined with massage. Treated in this manner, most cases of sprain recover in a week.

Good Results of Changing the Intestinal Flora

Q. **Are the effects of changing the intestinal flora so marked as to be easily recognizable?**

A. Yes. The putrid odor disappears from the stools; the sallow color of the skin is replaced by the clear tint of health; the tongue becomes clean, the breath sweet; courage, vivacity, amiability, and optimism take the place of discouragement, depression, irritability, pessimism, and a process of rejuvenation, when old age is not too far advanced, proceeds to a degree often almost unbelievable. One seems to be born again and to have renewed his youth.

On of the editors of the *New York Evening Post,* describing his condition before and after bringing about a change of flora and application of the principles presented in this work, said in an article entitled "Suicide by Autointoxication," published in the *Evening Post Magazine,* Dec. 16, 1919:

"I became painfully emaciated; my complexion was sallow, my heart irregular; I dreaded to eat, to work, to travel, to go to a concert or opera; often I lay awake at night, wondering why. It was one d—d thing after another, and I feared the future. My friends could see death painted in my face, and so could I when I looked in the mirror.

"That was ten months ago. Today I am as healthy as a mountain trout, as happy as a skylark. I gained sixteen pounds in sixteen weeks ,and now I sleep eight or nine hours without a break, eat anything I please, work with zest, long for a trip round the world, and make an infernal nuisance of myself by telling everybody I know—men, women and children—about the hygienic methods which have in these few months, made me look and feel twenty years younger, while revelling day and night in the exhilarating, voluptuous process of rejuvenation.

"When a man looks and feels twenty years younger he *is* twenty years younger; for age is not a matter of years, but of health, vitality, and vigor."

Thousands of others have had a similar experience. The most pronounced changes are often noted in the eyes.

The Effects of Colon Poisons on the Eye

Q. **Is it true that constipation, or autointoxication may influence the eyesight?**

A. Yes. The poisons produced in the colon cause premature aging of every bodily structure. The crystalline lens is highly sensitive to these poisons.

Dr. Ernest Clark, an eminent English eye specialist, says:—

"In quite early youth the crystalline lens is practically a small bag of semifluid jelly, and accommodation takes place by its being squeezed by the action of the ciliary muscle in such a manner that its anteroposterior diameter is enlarged. So great is the squeezability (if I may use the term) of the lens in the very young, that an accommodation power of 20 D. can often be recorded. As age advances a hardening process, or sclerosis, goes on in the lens as in all other tissues of the body, and so its elasticity becomes less and less, until a point is reached when the near point of accommodation which represents the fullest accommodative power has so far receded that the normal eye requires assistance in the shape of a convex lens in order to see near objects distinctly. This hardening of the lens may be delayed by the absence of, and accelerated by the presence of, certain poisons in the system, and intestinal toxemia takes a very high place in the list.

"One individual has only an accommodative power of 2.5 D., while another has 8.5 D. What is the difference between these two individuals? In the one aged forty with only 2.5 D. accommodative power the lens has hardened prematurely and become equal to the lens of a man aged fifty-five. That is, he is suffering from premature senility, and in the great majority of cases, in physical appearance, habits and powers, he is aged fifty-two. There are many causes which help toward this premature senility, but the factor common to a very large majority of

them is intestinal stasis. On the other hand, those whose accommodative power is higher than normal look much younger, and on going into their history it will be found invariably that they have taken the greatest care to avoid the least suspicion of intestinal stasis."

A young woman of eighteen years found her sight failing. Examination by an eye specialist showed that her accommodation was so much impaired that she needed glasses such as are usually worn by a person of fifty years. By a change of regimen and improvement of bowel action as recommended in this work the abnormality in a few weeks disappeared and the eyes became normal.

The accommodation of the eye may be used as a test for the effects of intestinal poisons upon the body in general, and is perhaps one of the most delicate tests known.

Dr. Beaumont's Digestion Table

Q. **Is the table prepared by Dr. Beaumont showing the time required for the digestion of different foodstuffs in the stomach to be relied upon?**

A. Dr. Beaumont was a man of scientific training and he enjoyed a remarkable opportunity for the study of gastric digestion which he improved to the utmost. From his work entitled, "Experiments and Observations on the Gastric Juice," published in 1833, we glean the following facts, together with a condensed table showing the results of his observations:—

Dr. Beaumont, in the year 1822, was stationed

at Michillimackinac, now known as the Island of Mackinac, as a military surgeon of the United States Army.

A French Canadian, aged eighteen years, named Alexis St. Martin, engaged in the service of the American Fur Company, was wounded by the discharge of a musket in such a way that a portion of the lower left chest, the size of a man's hand, was carried away, injuring the left lung and the diaphragm, and opening into the stomach.

In spite of the terrible character of the wound, the young man, thanks to his robust condition and the good care given him by Dr. Beaumont, at the end of four weeks was practically recovered, with the exception of the opening into the stomach, which remained permanent. Through this opening, the size of a man's finger, Dr. Beaumont had an opportunity to watch the process of digestion and to make observations such as never before had been made. Thanks to his exact and painstaking studies, carried on through a number of years, a considerable fund of most valuable information concerning the process of gastric digestion was accumulated.

The following table contains the principal facts observed by Beaumont in relation to the time required for the gastric digestion of the various foodstuffs named:—

Rice	boiled	1:00
Sago	boiled	1:45
Tapioca	boiled	2:00
Barley	boiled	2:00
Milk	boiled	2:00
Milk	raw	2:15
Gelatine	boiled	2:30
Tripe, soused	boiled	1:00

Brains, animal	boiled	1:45
Venison, steak	broiled	1:35
Spinal marrow, animal	boiled	2:40
Turkey, domesticated	roasted	2:30
Turkey, domesticated	boiled	2:25
Goose, wild	roasted	2:30
Pig, sucking	roasted	2:30
Liver, beef's, fresh	broiled	2:00
Lamb, fresh	broiled	2:30
Chicken, full grown	fricaseed	2:45
Eggs, fresh	hard boiled	3:30
Eggs, fresh	soft boiled	3:00
Eggs, fresh	fried	3:30
Eggs, fresh	roasted	2:15
Eggs, fresh	raw	2:00
Eggs, whipped	raw	1:30
Custard	baked	2.45
Codfish, cured dry	boiled	2:00
Trout, salmon, fresh	boiled	1:30
Trout, salmon	fried	1:30
Bass, striped, fresh	broiled	3:00
Flounder, fresh	fried	3:30
Catfish, fresh	fried	3:30
Salmon, salted	boiled	4:00
Oysters, fresh	raw	2:55
Oysters, fresh	roasted	3:15
Oysters, fresh	stewed	3:30
Beef, fresh, lean, rare	roasted	3:00
Beef, steak	broiled	3:00
Beef, with salt only	boiled	3:36
Beef, with salt only	fried	4:00
Beef, old, hard, salted	boiled	4:15
Pork, steak	broiled	3:15
Pork, fat and lean	roasted	5:15
Pork, recently salted	boiled	4:30
Pork, recently salted	fried	4:15
Pork, recently salted	raw	3:00
Pork, recently salted	stewed	3:00
Mutton, fresh	roasted	3:15
Mutton, fresh	boiled	3:00
Veal, fresh	broiled	4:00
Veal, fresh	fried	4:30
Fowls, domestic	boiled	4:00
Fowls, domestic	roasted	4:00
Ducks, domesticated	roasted	4:00

Ducks, wild	roasted	4:30
Suet, beef, fresh	boiled	5:30
Suet, mutton	boiled	4:30
Butter,	melted	3:30
Cheese, old, strong	raw	3:30
Soup, beef, veg. and bread	boiled	4:00
Soup, marrow bones	boiled	4:15
Soup, bean	boiled	3:00
Soup, barley	boiled	1:30
Soup, mutton	boiled	3:30
Green corn and beans	boiled	3:45
Chicken soup	boiled	3:00
Oyster soup	boiled	3:30
Hash, meat and vegetable	warmed	2:30
Sausage, fresh	broiled	3:20
Heart, animal	fried	4:00
Tendon	boiled	5:30
Cartilage	boiled	4:15
Aponeurosis	boiled	3:00
Beans, pod	boiled	2:30
Bread, wheat, fresh	baked	3:30
Bread, corn	baked	3:15
Cake, corn	baked	3:00
Cake, sponge	baked	2:30
Dumpling, apple	boiled	3:00
Apples, sour, hard	raw	2:50
Apples, sour, mellow	raw	2:00
Apples, sweet, mellow	raw	1:30
Parsnips	boiled	2:30
Carrot, orange	boiled	3:15
Beets	boiled	3:45
Turnips, flat	boiled	3:30
Potatoes, Irish	boiled	3:30
Potatoes, Irish	baked	2:30
Cabbage, head	raw	2:30
Cabbage, with vinegar	boiled	4:30

Dr. Beaumont's Observations on Digestion

Q. **What new observations were made by Dr. Beaumont?**

A. Among the conclusions reached by Dr. Beaumont from more than eighteen hundred experiments which were made upon Alexis St. Martin, are the following:—

"That digestion is facilitated by *minuteness* of *division* and *tenderness* of *fibre,* and retarded by opposite qualities."

"That the *quantity* of food generally taken, is more than the wants of the system require, and that such excess, if persevered in, generally produces, not only functional aberration, but disease of the coats of the stomach."

"That *bulk,* as well as *nutriment,* is necessary to the articles of diet."

"That the time for the digestion of food . . . is from three to three and a half hours."

"That *solid* food, of a certain texture, is easier of digestion, than *fluid.*

That stimulating *condiments* are injurious to the healthy stomach.

"That the use of *ardent spirits always* produces disease of the stomach, if persevered in.

"That *hunger* is the effect of *distention* of the vessels that secrete the gastric juice.

"That the *first* stage of digestion is effected in the stomach.

"That the temperature is *not elevated* by the ingestion of food.

"That *exercise elevates* the temperature; and that *sleep* or *rest,* in a recumbent position, *depresses* it.

"The gastric juice checks the process of putrefaction.

"That *gentle exercise* facilitates the digestion of the food.

"That *bile* is not ordinarily found *in the stomach,* and is *not* commonly *necessary* for the digestion of food; but

"That, when oily food has been used, it assists its digestion.

"That *water, ardent spirits,* and most other *fluids* are not affected by the gastric juice, but pass from the stomach soon after they have been received."

The Composition of the Soy Bean

Q. **What is the composition of the soy bean, especially in relation to the amount of carbohydrate it contains?**

A. The many analyses of the soy bean which have been published indicate that it contains a very small percentage of sugar and a mere trace of starch.

The following table is compiled from the analyses published by the United States Government and by Bailey and Street, (*Journal of Industrial and Engineering Chemistry, 1915*):

	Per Cent
Water	8.5
Protein	39.5
Fat	18.5
Starch	0.5
Cane sugar	3.0
Invert sugar and raffinose	1.2
Dextrin	3.0
Galactan	5.0
Pentosan	5.0
Wax	8.0
Cellulose	3.0
Ash	4.8

It is evident from the above that the soy bean contains little which can be objectionable in diabetes. Dextrin, sugars and starch together amount to only 7½ per cent. Of these the sugars may be easily removed by parboiling, which will leave behind only a trace of starch.

Non-Poisonous Dyes

Q. **Are there any dyes or coloring substances which may be used without injury for the coloring of foods?**

A. According to Dr. H. W. Wiley (Food Inspection Decision No. 76), the following dyes are made "specifically for use in foods," and are guaranteed to be free from harmful substances:

Red shades:
107. Amaranth.
56. Ponceau 3 R.
517. Erythrosin.

Orange shade:
85. Orange I.

Yellow shade:
4. Naphthol yellow S.

Green shade:
435. Light green S. F. yellowish.

Blue shade:
692. Indigo disulfoacid.

Dried Tamarinds an Antiscorbutic Food

Q. **Are there other foods besides citrus fruits good to prevent and cure scurvy?**

A. The large number of deaths which result annually among children of the poor as the result of infantile scurvy has led in recent years to a wide-spread investigation of the antiscorbutic properties of different foods, in the hope of increasing the number of foodstuffs found to be rich in the vitamins needed to prevent scurvy. Heretofore, fresh fruits and vegetables, fresh milk, and especially orange juice, lemon juice, and potato soup, have been chiefly de-

pended upon as preventives of scurvy. More recently, this valuable property has been found to be possessed by the fresh juice of tomatoes and of turnips.

Most foods lose most of their anti-scurvy properties when dried; but it has now been shown that the dried tamarind and the mango, two fruits found in great abundance in tropical countries, are capable of preventing scurvy. They are largely used and highly esteemed for this purpose in India. They are, perhaps, not quite equal to orange juice, the swede turnip, cabbage and sprouted beans, but they are fully equal to carrots, cooked potatoes, the beet root and meat juice.

The Food Value of the Banana

Q. **What is the relative food value of the banana?**

A. Viewed from a chemical standpoint, the banana has nearly the same food value as the Irish potato. Carefully conducted experiments in animal feeding, however, have shown that the banana is in certain respects much inferior to the potato. The potato, as is well known, possesses very pronounced anti-scorbutic properties. An ounce of potato soup is practically equal to the same quantity of orange juice in the prevention of scurvy in young infants.

But the banana is much inferior to the potato in the amount of its vitamin content. It also seems to be deficient in other vitamins.

Recent experiments conducted by Lewis showed that guinea pigs fed on an exclusive

diet of bananas die in twenty to thirty days. Nearly an ounce of bananas a day, with a diet of rolled oats is found sufficient to prevent scurvy but does not support normal growth in young animals. Young animals fed on rolled oats with bran and milk were protected from scurvy by half an ounce of bananas daily.

The Food Value of Bran

Q. **Is bran of value as food or only useful as roughage?**

A. Bran has a real food value. It not only furnishes a rich supply of food lime, food iron and vitamines, which are usually lacking in most foods, and also supplies a considerable amount of digestible starch and protein. Hindhede, the Hoover of Denmark during the war, stated in an article in the *Journal of the American Medical Association* (Feb. 7, 1920) that during the war the people of Denmark used an unusual amount of bran. He says:

"In other countries, for example, Germany, Holland and Norway, the question was discussed whether grain should be milled to yield 70, 80, 90 or 94 per cent of bolted flour. We not only milled our rye to 100 per cent but, profiting by previously made experiments, we added all our wheat bran to the whole rye bread; and as we added also 24 per cent of barley meal (milled to 95 per cent, only the coarsest shells being removed) we had more than twice the amount of bread we would have had if we had milled only to 70 per cent. As the difference in digestibility was only 9 per cent (94-85) we got about twice

the amount of digestible bread. And, be it emphasized, we could bake good bread with this mixture. People entered no complaints; there were no digestive troubles, but we are accustomed to the use of whole bread and we know how to make such bread of good quality. If further proof were needed, this war experiment on such a large scale has demonstrated that bran is excellent food.

"These findings agree with those of Osborne and Mendel. These investigators found that bran is very good food for rats, and that mixed with white flour it can take the place of meat and eggs. Their results lead me to conclude—if I may be permitted to apply results obtained on rats to human beings—that: As bran can replace meat and eggs, man should eat whole bread and not so much of the more costly foods. Mendel concludes contraiwise: As people eat enough of meat and eggs, 'no practical advantage on this score can be expected by converting the entire grain into flour'! In my opinion, Mendel not only overlooks the economical question, but also that there are good reasons for believing that a diet composed mostly of meat, eggs and white bread—a common diet of the well-to-do—is far from being a healthful diet. Even in the case of the rats, a meat diet seems eventually to be harmful. Although rats can thrive quite well on a meat diet—which man cannot do—the young of meat fed rats seldom survive. The fact of the matter is that it is claimed that rats, like human beings, will not choose an exclusive meat diet from natural instinct. That statement does

not, however, apply to the rat. Watson says on the basis of his numerous experiments on rat feeding: 'I have never seen a young rat which would look at porridge or milk if meat was available.' I have seen 'human' rats who would not eat porridge when beefsteak was available. And we know that beef, in large amounts, is not good food for either man or rat.

"While not all readers will agree with what I have said, no one can dispute the fact that the people of Denmark have no cause to regret that during the war their diet consisted mostly of milk, vegetables and bran. If Central Europe had adopted a similar diet I doubt that any one would have starved."

Spasmodic Croup

Q. **What is the best means of relieving the respiratory spasm in croup?**

A. Simple, spasmodic croup, unaccompanied by diptheritic infection or chronic bronchial catarrh, occurs most frequently in children suffering from rickets, hence the nutritive disorder which is the predisposing cause should be combated by a careful regulation of the diet. Certified milk should be used instead of pasteurized or sterilized milk. The child should be given two or three ounces of sweet orange juice daily. Purees of spinach, turnips, potatoes, carrots and other vegetables should be made a part of the daily diet. The child should be kept out-of-doors as many hours as possible during the daytime and at night should sleep on a sleeping porch or in a room with several windows widely

opened. The bowels should be kept open by the free use of bran. At least two heaping teaspoonfuls of bran should be eaten three times a day by a child two years old or over. One to two teaspoonfuls of paraffin oil should be given at each meal if the bowels do not move freely two or three times a day.

It is well to give an enema at night to make certain that the colon is completely emptied. The amount of water should be four to twelve ounces, according to the age of the child, at a temperature of ninety degrees.

The child should be given a cool hand-rub or towel bath at a temperature of seventy to eighty degrees every morning. The bath should be followed by an oil rub.

Care should be taken to see that the child's mouth is kept in a wholesome condition, the tongue clean and the teeth polished, using the Hygos polishing paper (see page 175).

For immediate relief when a spasm occurs, there are three measures, all of which are effective.

1. Sprinkle cold water in the child's face and on his chest. This measure often succeeds promptly.

2. A more efficient measure is to sieze the child by the feet, holding it upside down, at the same time slapping it smartly upon the back.

3. A more effective method, which can be relied upon when others fail, is the alternate hot and cold bath. Place the child in a tub of water at a temperature of 100° F. to 102° F. The spasm of the larynx will often relax as

soon as the child is placed in the hot water. If the "crowing" respiration does not cease within a few seconds, lift the child out of the warm water and dash a basin full of cold water over it, then restore it to the warm bath. Repeat this several times if necessary.

If a tub is not easily accessible, alternate hot and cold compresses may be applied. Wring a cloth out of hot water. Apply it to the throat and upper chest, bringing well up under the jaws and covering the ears. After the hot compress has been in place for fifteen or twenty seconds, remove it and instantly apply a compress wrung out of cold water. After ten or fifteen seconds, renew the hot compress. Repeat several times. Instead of the cold compress, a piece of ice may be rubbed over the neck and upper chest.

A warm enema may often be used with advantage, and the child should be given warm water or hot lemonade to drink in liberal quantities.

In cases in which there is a tendency for the difficulty to return at short intervals, a steam inhaler renders valuable aid. An open umbrella should be placed over the child and the whole covered with a sheet, which is pinned to the umbrella, making a sort of tent. Steam is then conducted under the tent from a "croup kettle," a coffeepot, a teakettle or other convenient source of steam. The simplest method of producing steam in such cases is to place under the tent a pan of hot water and drop into this every few minutes a large pebble or a small piece of iron or other metal which has been heated in the fire. The heated object should not be too large or so

great a volume of steam will be produced as to incur the risk of burning the little patient.

Steam may also be produced by placing quicklime in a pan containing a little water.

The most convenient method of producing steam is by the Electric Vapor Thermophore (see accompanyng cut).

Steam Inhalation

Q. **What is the best method of producing steam for inhalation and for what diseased conditions is steam inhalation recommended?**

A. Steam may be produced by means of an oil or alcohol lamp placed upder a small basin of water, or by heated objects such as large pebbles or small pieeces of metal dropped into a pan containing an inch of water.

The best means of producing steam for inhalation is the Electric Vapor Thermophore. This is an appliance in which water is heated by electricity. It may be used for steam inhalations and for applying steam to the nose, eyes, ears or any portion of the body's surface. It may be also used for a general vapor bath, as illustrated in the accompanying cuts.

This appliance is to be recommended for the treatment of acute and chronic sore throat, bronchitis, nasal catarrh, earache, middle ear deafness, a severe cold, neuralgia of the face or other parts, neuritis, rheumatic joints, acne of the face, boils, and for the application of continuous moist heat for any purpose desired.

The appliance is manufactured by the Sanitarium Equipment Company, Battle Creek, Mich.

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